THE NATIONAL GEOGRAPHIC MAGAZINE

Vol. XII DECEMBER, 1901 No. 12

CONTENTS

DIARY OF A VOYAGE FROM SAN FRANCISCO TO TAHITI AND RETURN, 1901. ILLUSTRATED. S. P. LANGLEY . . . PAGE 413

THE LOST BOUNDARY OF TEXAS. ILLUSTRATED. MARCUS BAKER 430

ICE CAVES AND FROZEN WELLS. W J McGEE 433

WESTERN PROGRESS IN CHINA 434

GEOGRAPHIC NOTES. ILLUSTRATED 436

GEOGRAPHIC LITERATURE 442

NATIONAL GEOGRAPHIC SOCIETY 448

McCLURE, PHILLIPS & CO.

$3.50 a Year NEW YORK 25 Cents a Number

REPRINT

Entered at the Post-office in Washington, D. C., as Second-class Mail Matter.

THE NATIONAL GEOGRAPHIC MAGAZINE

A ILLUSTRATED MONTHLY, published for the NATIONAL GEOGRAPHIC SOCIETY, of Washington, D. C., by McCLURE, PHILLIPS & Co., at 141 East 25th Street, in New York City, to whom all business communications should be addressed. Editorial communications should be addressed to the Managing Editor of the NATIONAL GEOGRAPHIC MAGAZINE, Corcoran Building, Washington, D. C.

25 CENTS A NUMBER; $2.50 A YEAR

Editor-in-Chief: HENRY GANNETT
Chief Geographer, U. S. Geological Survey

Managing Editor: GILBERT H. GROSVENOR

Associate Editors

GENERAL A. W. GREELY
Chief Signal Officer, U. S. Army

W J McGEE
Ethnologist in Charge, Bureau of American Ethnology

C. HART MERRIAM
Chief of the Biological Survey, U. S. Department of Agriculture

DAVID J. HILL
Assistant Secretary of State

ELIZA RUHAMAH SCIDMORE
Author of "Java, the Garden of the East," etc.

MARCUS BAKER
U. S. Geological Survey

WILLIS L. MOORE
Chief of the Weather Bureau, U. S. Department of Agriculture

O. H. TITTMANN
Superintendent of the U. S. Coast and Geodetic Survey

O. P. AUSTIN
Chief of the Bureau of Statistics, U. S. Treasury Department

IDA M. TARBELL
Author of "Life of Napoleon," "Life of Lincoln," etc.

CARL LOUISE GARRISON
Principal of Phelps School, Washington, D. C.

McCLURE, PHILLIPS & CO.,

NEW YORK

Southern Railway

GREATEST SOUTHERN SYSTEM

To all Points SOUTH, SOUTHEAST, and SOUTHWEST

Through Pullman Drawing Room Sleeping Cars from New York and Washington to Atlanta, Macon, New Orleans, Memphis, Nashville, Port Tampa, Jacksonville, Augusta, and Intermediate Points—First-Class Day Coaches—Dining Car Service—Club Cars

Fast trains for the SOUTH leave Washington Daily at 11.15 a. m., 9.50 p. m., 9.55 p. m., and 10.45 p. m.

Through Tourist Car on the 9.55 p. m. train every Monday, Wednesday, and Friday for Texas, Arizona, and California points, without change.

Direct line to the Summer Resorts in Virginia and the Carolinas, and the Winter Resorts of Florida, Gulf Coast, Texas, Mexico, and California.

Direct Through Car Line to and from Asheville, Hot Springs, and other Western North Carolina points—

"THE LAND OF THE SKY"—"THE BEAUTIFUL SAPPHIRE COUNTRY."

For Map Folders, Summer Homes Folder, "The Empire of the South," "The Beautiful Sapphire Country," "The Land of the Sky," "Cuba, Nassau, and Porto Rico," write to

A. S. THWEATT, Eastern Passenger Agent, 1185 Broadway, New York, N. Y.
S. E. BURGESS, Traveling Passenger Agent, 120 E. Baltimore Street, Baltimore, Md.
L. S. BROWN, General Agent, 705 Fifteenth Street N. W., Washington, D. C.

W. H. TAYLOE, Assistant General Passenger Agent, Atlanta, Ga.
C. A. BENSCOTER, Assistant General Passenger Agent, Chattanooga, Tenn.
GEO. B. ALLEN, Assistant General Passenger Agent, St. Louis, Mo.

F. S. GANNON, Third Vice-President and General Manager, S. H. HARDWICK, General Passenger Agent,
WASHINGTON, D. C.

SPECIAL MAPS PUBLISHED BY THE NATIONAL GEOGRAPHIC SOCIETY

Map of Alaska (28 x 24 inches). Vol. IX., No. 4.
Chart of the World on Mercator's Projection (48 x 27 inches). Vol. VII., No. 3.
Map of South Africa (46 x 33 inches). Vol. X., No. 12.
Map of the Chinese Empire, Japan, and the Russian-Manchurian Railway (11 x 7½ inches). Vol. XI., No. 8.
Twelve Maps on the Alaskan Boundary Dispute. Vol. X., No. 11.
Map of Cuba (18 x 7½ inches). Vol. IX., No. 5.
Twenty-five Full-page Charts, showing storm tracks and methods of weather forecasting. Vol. VIII., No. 3.
Map of Northeastern China (36 x 28 inches). Vol. XI., No. 9.

BY MAIL FOR 25 CENTS EACH

HENRY ROMEIKE'S BUREAU OF PRESS CUTTINGS

110 Fifth Avenue, New York

Reads every paper of importance published in the United States, and through its European agencies in London, Paris, Berlin and Vienna every paper of importance published in Europe and the British Colonies. One subscription on any given subject will bring notices from the United States, and if desired also from the European papers.

WRITE FOR TERMS

McClure, Phillips & Co.

Fall Books Under this Imprint

Life on the Stage by Clara Morris

Chapter First
I Am Born

IF this simple tale is to be told at all, it may as well begin at the beginning and in the good old-fashioned and best of all ways—thus: Once upon a time in the Canadian city of Toronto, on the 17th of March, the sun rose bright and clear—which was a most surprising thing for the sun to do on St. Patrick's Day, but while the people were yet wondering over it the sunlight disappeared, clouds of dull gray spread themselves evenly over the sky, and then the snow fell—fell fast and furious—quickly whitening the streets and house-tops, softly lining every hollow, and was piling little cushions on top of all the hitching-posts, when the flakes grew larger, wetter, farther apart, and after a little hesitation turned to rain—a sort of walk-trot-gallop rain, which wound up with one vivid flash of lightning and a clap of thunder that fairly shook the city. Now

Reminiscences of a Great Actress

"SHE can write!" This is a common exclamation from readers of Miss Morris's personal recollections. Indeed, it is rather surprising that the greatest emotional actress of her time should in turn achieve a literary success nearly as great. "Her versatility almost dazzles me," writes Edward Bok. Yet here is her volume of charming reminiscences, and we must believe our eyes. In these true stories of hers, the Booths, Lawrence Barrett, Jim Fisk, Augustin Daly, and many another figure out of the past live again. 12mo, $1.50. Postpaid, $1.62.

Tristram of Blent by Anthony Hope

Chapter First
A Suppressed Passage

MR. JENKINSON NEELD was an elderly man of comfortable means; he had chambers in Pall Mall, close to the Imperium Club, and his short, stoutish figure, topped by a chubby, spectacled face, might be seen entering that dignified establishment every day at lunch time, and also at the hour of dinner when he had no invitation elsewhere. He had once practiced at the bar, and liked to explain that he had deserted his profession for the pursuit of literature. He did not write, however, on his own account; he edited. He would edit anything providing there was not public demand for an edition of it. Regardless of present favor, he appealed to posterity—as gentlemen with private means are quite entitled to do. Perhaps he made rather high demands on posterity; but that was his business—and its. At any rate his taste was curious and

In Its 25th Thousand

SAYS the *Philadelphia Telegraph*: "It is a rare delight for the novel reader, original in conception and handling, bright and readable, dramatic and powerful. Even those who have great expectations will find their expectations realized. It is fully as interesting as 'The Prisoner of Zenda,' while much more complete and satisfactory."

N. Y. Sun:—"It is certainly the most serious piece of work that he has done—serious not in the ordinary sense of the word, but as regards what has been accomplished." 12mo, $1.50.

The Westerners by Stewart Edward White

Chapter First
The Half-breed

A TOURIST of to-day, peering from the window of his vestibule train at the electric-lit vision of Three Rivers, as it stars the banks of the Missouri like a constellation against the blackness of the night, would never recognize in the trim little town the Three Rivers of the early seventies. . . . To restore the latter, he would be called upon to substitute, in place of the brick stores and dwellings of to-day, a motley collection of lean-tos, dugouts, tents and shacks scattered broadcast over the virgin prairie. He must imagine a multitude more heterogeneous, perhaps, than could be gathered anywhere else in the world—tenderfeet from the East; mountaineers from Tennessee and Kentucky bearing their historic long pea rifles; soft-voiced Virginians; keen, alert woodsmen from the North; wiry, silent trappers and scouts from the West;

In Its 2d Edition

A FRONTIER story of the Black Hills.

"One of the strongest American novels of the year."—*Philadelphia Inquirer*.

"'The Westerners' lays strong hold on the reader. The thing is vital."—*Chicago Record-Herald*.

"Virile, genuine, unhackneyed. The sketches of Western life and character are a constant source of enjoyment. It appeals somehow to the adventuresome spirit which lies more or less hidden even in the most quiet of us."—*N. Y. Commercial Advertiser*.

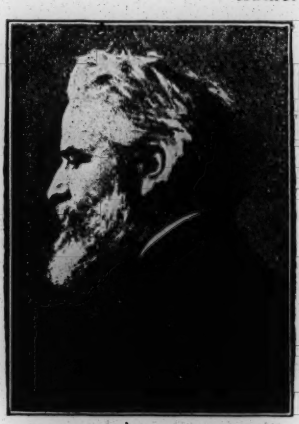
12mo, $1.50.

XUM

Lincoln, and Other Poems

by Edwin Markham

Author of "The Man With the Hoe"



MR. MARKHAM'S LATEST PORTRAIT

"WHEN the Norn-Mother saw the Whirlwind Hour,
Greatening and darkening as it hurried on,
She bent the strenuous heavens and came down
To make a man to meet the mortal need.
She took the tried clay of the common road—
Clay warm yet with the genial heat of earth,
Dashed through it all a drain of prophecy;
Then mixed a laughter with the serious stuff.
It was a stuff to wear for centuries,
A man that matched the mountains, and compelled
The stars to look our way and honor us."

Opening stanza from Lincoln, the Great Commoner.

12mo, $1.00 *net*. Postpaid, $1.08.

Songs of Nature by John Burroughs

From the Preface

"THIS collection represents on the whole my judgment of the best Nature poems at my disposal in the language. I am surprised at the amount of so-called Nature poetry that has been added to English literature during the past fifty years, but I find only a little of it of permanent worth. The painted, padded, and perfumed Nature of so many of the younger poets I cannot stand at all. I have not knowingly admitted any poem that is not true to my own observations of Nature."

An Anthology of Nature Poetry

"A TORTUOUS and difficult channel may add to the beauty of a mountain brook, but it does not add to a poem."

This book contains the truest and the simplest, the most beautiful and the best English Nature verse since the time of Shakespere to the present. It contains many old favorites and not a few of those rare and delicate flowers of poetry which occasionally elude the notice of the more casual reader. 12mo, $1.50.

Anna Karenin by Count Leo Tolstoy

Translated by Mrs. Garnett

MRS. GARNETT is well known from her translations of Turgenieff, a work which the London Academy crowned as one of the literary achievements of the year. She is the wife of Edward Garnett, prominent in London as an essayist and general man of letters, the son of Dr. Richard Garnett, curator of the British Museum, poet and Eastern scholar.

Directly from the Russian

A TRANSLATION directly from the Russian, characterized by the limpid beauty of Mrs. Garnett's English, which holds closely to the strong and masterly expression of the original. Her "Anna Karenin" promises to take equal rank with her Turgenieff among translations. With photogravure frontispiece. 2 vols., 8vo. Per set, $4.00 *net*. Postpaid, $4.40.

The House with the Green Shutters

by George Douglas

The Author

BORN in the west of Scotland of a parentage half-Scotch-and-Irish, and brought up amidst a farming and mining population, George Douglas Brown knows through and through the life in the Scottish country districts and the interior village. In his new book he has sounded a note which only Mr. Thomas Hardy has sounded in our time; and at the same time his work is so different from Hardy's that it does not even suggest that Mr. Douglas is in the position of a disciple.

THIS is something new in a story of Scottish village life. The characteristic humor is there, yes; but there is added a grim realism which makes a most impressive combination. The tragic downfall of a family dominant in a little Scottish town is told in a way which attests the author's art by the very sense of its inevitability. 12mo, $1.50.

McCLURE, PHILLIPS & CO., PUBLISHERS, NEW YORK

National Geographic Society

OFFICES . . . . Rooms 107, 108 Corcoran Building
Fifteenth and F Streets N. W., Washington, D. C.

Office Hours: 8.30 A. M. to 5 P. M. Telephone No., Main 471

ALEXANDER GRAHAM BELL	President
W J McGEE	Vice-President
JOHN JOY EDSON	Treasurer
A. J. HENRY	Secretary
ELIZA R. SCIDMORE	Foreign Secretary

BOARD OF MANAGERS

1898-1901	1899-1902	1900-1903
A. GRAHAM BELL	CHARLES J. BELL	MARCUS BAKER
HENRY GANNETT	G. K. GILBERT	HENRY F. BLOUNT
A. W. GREELY	A. J. HENRY	F. V. COVILLE
JOHN HYDE	DAVID J. HILL	S. H. KAUFFMANN
W J McGEE	C. HART MERRIAM	WILLIS L. MOORE
GIFFORD PINCHOT	JOHN JOY EDSON	W. B. POWELL

The National Geographic Magazine is sent free of charge to all members of the National Geographic Society

Recommendation for Membership in the National Geographic Society

The following form is enclosed for use in the nomination of persons for membership.

Please detach and fill in blanks and send to the Secretary

DUES: Annual membership, $2; Life membership, $50. If check be enclosed, please make it payable to order of the National Geographic Society, and, if at a distance from Washington, remit by New York draft or P. O. money-order.

----------*1901*

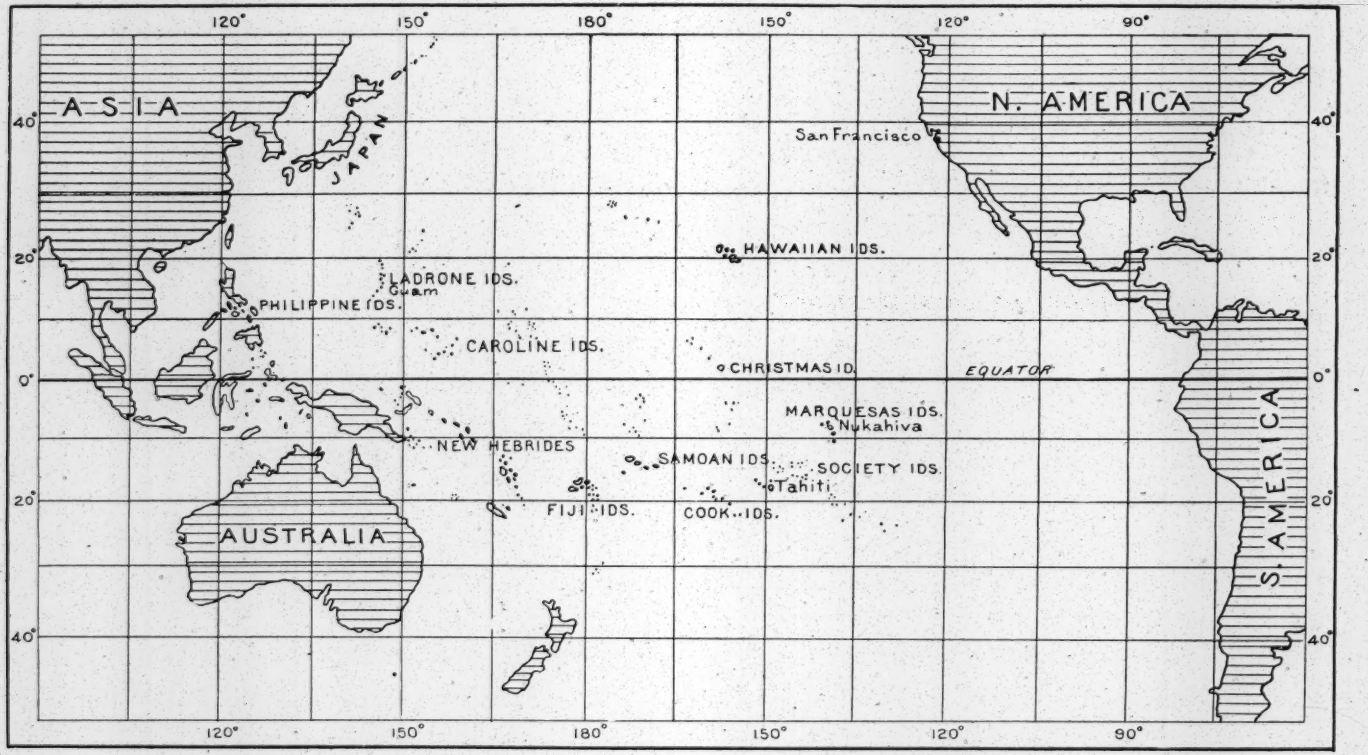
To the Secretary, National Geographic Society, Washington, D. C.:

Please propose ----------

address : ----------

----

for membership in the Society.



Outline Map Showing Position of Tahiti in Mid Pacific

VOL. XII, No. 12 WASHINGTON DECEMBER, 1901

THE NATIONAL GEOGRAPHIC MAGAZINE

DIARY OF A VOYAGE FROM SAN FRANCISCO TO TAHITI AND RETURN, 1901

BY S. P. LANGLEY

PREFACE

UNTIL lately Tahiti (Cook's Otaheite) has been reached from the United States only by a sailing schooner from San Francisco in a voyage of six or seven weeks. There has been an occasional steamer from New Zealand; and the French, who are in possession of the island, send a warship at intervals; but on the whole the islanders are in very much the same condition that they were a hundred years ago.

The French Government has just subsidized a vessel of the Oceanic Steamship Company, which is to make a trip to Tahiti once in every five weeks, the voyage lasting only about eleven days. On the occasion of the French National Fête, on the 14th of July (1901), the company advertised a trip widely throughout the United States.

I was led to think that the occasion was one for seeing the native ways and customs of the islands before the innovations that would be introduced by the steamer communication in the future, and, expecting to have a companion, I had arranged to take the voyage. My companion failed me at the last moment, and I took the trip alone, commencing my diary with the departure from San Francisco. I have published it as written at the time, without modifying the style such diarial notes naturally take.

June 25.—In the morning of the 25th of June I went down to see the *Australia* at the dock. She is a long, narrow vessel, painted white, of 3,200 tons burden, with great piles of lumber on her main deck, and evidently both old and overloaded. I secured my passage with some misgiving.

June 26.—Going down to the boat at 9.30 a. m., I hear from more competent judges than myself the confirmation of my feeling that the boat is extremely overloaded. The depth to which she has sunk in the water and the lumber on the decks say this even to a landsman's eye; but when I get on board of

her, things in other respects look better. She has a prepossessing set of officers, and as the first-cabin passengers are only about forty in number, there will evidently be plenty of room. A considerable part of the passengers appear to be minor French officials, but there are also some Californians, who promise pleasant company, and it appears that many of the passengers are not going to stay, but are on a pleasure trip. We are told that we are to stop at the Marquesas Islands, the scene of Herman Melville's adventures in "Typee," there to take on 300 Marquesan savages, who are going to Tahiti to participate in the French fête on the 14th of July.

The vessel flies the French flag. We get under weigh very promptly at ten o'clock and pass through "the Golden Gate" into the Pacific, running for three or four hours directly down the coast and within a mile or so of it. A great black whale, a mile or two away, thrashing about and throwing up his tail, is an interesting object. The sea is not high, but comes freely onto the main deck, which is perhaps only six feet out of water! We are accompanied by an increasing number of "goonies," a dark brown bird, spreading five or six feet of long narrow wings, the notable character of which is that they are at all times, in sailing flight, carried *below* the body. It flapped and then sailed with extreme swiftness, constantly turning till the line joining the wings was almost vertical, and in this position the tip of the lower wing appeared to just graze the water, but I never saw it pick up anything in this flight.

The table is good for a vessel of the kind There are some pleasant passengers, and there is an electric light and ice-making plant, so that the vessel is better than her looks.

June 27.—It is cold enough to make semi-winter clothing comfortable, and I turned in at 9.30 o'clock and slept for ten hours in spite of the occasional seas which broke over the main deck in solid water, once striking against my stateroom window on the upper deck (starboard side) with a bang, as if they would stave it in. Our course was south, and even south by east. Vessel rolls less. It is still pleasantly cool; bright sun.

June 28.—Slightly overcast and misty; not as cool, but not hot; read and conversed with fellow-passengers.

June 29.—Today, about noon, we enter the tropics The run has been 316 miles. The days are still cool; the weather is just right. I sit forward on the broad upper deck, beneath the awning, with four or five pleasant people; read, talk, sleep, and am content. Most of the passengers are on the port side of the main deck below, the vessel rocks lullingly, and there is an occasional mist. The last "goony" left us today.

"The Injian Ocean sets an' smiles,
So sof', so bright, so bloomin' blue;
There aren't a wave for miles an' miles,
Excep' the jiggle from the screw."

June 30.—Sunday; no observance. Day slightly warmer, but pleasant. We are about half way to the Marquesas, and no sight of a sail nor any sign of man, probably, until we get to them. One does not like to think of fire or an accident happening *here*.

The captain has an instrument, which he calls a *Pelorus*, for getting the true course of the vessel by the sun—something like a marine solar compass.

Got a list of Tahitian words from a lady passenger, Mrs. Hart, the wife of the Captain Hart mentioned in Stevenson's South Seas. Stevenson says that in 1878 (when he wrote) cannibalism was not yet extinct in the Marquesas, whose inhabitants he calls the most savage of the South Seas. Mrs. Hart confirms Stevenson's account of the massacre on her husband's plantation, and his account in general. He mentions that the natives were prevented by the French Government from carrying away whole the bodies of the slain

to eat, but, finding a lot of empty match-boxes, they cut up one body into small pieces and sent it as tid-bits in these little boxes over the island!

July 1.—In the "Doldrums;" much warmer. A white gull with a long feather in its tail (the "tropic bird") and sundry flapping and diving birds accompany the vessel.

July 2.—Frequent showers; warm.

July 3.—Vessel rolls a great deal, many sick, but I am exempt. Cool wind and very pleasant.

July 4.—Pass the Equator at 7 a. m. ship's time. Celebration by the Americans—speeches, one by Judge K., brief and appropriate. In afternoon, games, "chalking the deck," mock prizes, etc.

July 5.—A little warmer. We are to see Nukahiva tomorrow morning.

THE MARQUESAS

July 6.—Awoke at 5.30, dressed, and went on deck. It was a quarter of an hour before sunrise, but only the eastern sky was bright. The boat's engine had stopped, and the bow was pointed to a great mass of rock of jagged outline, yet covered with green nearly to the summit, all laying to the north of us. The sun below the horizon seemed to radiate greenish-blue fan-shaped streamers, the sky between and below which shifted rapidly between these and primrose tints, or what was not primrose, but some nameless shade of delicate quickening color, that we all looked at in delight. Just before the sun arose the bright light struck between the awning and the deck and lit up the groups of passengers on a dark background with an effect like that of the lime-light at a play. It was perfect, unless it might have been charged with being a bit theatrical!

The vessel anchored half a mile from the shore. The harbor of Tyowai is on the south of the island. We waited two or more hours, apparently until the French official in charge had finished his breakfast, and only at 9 o'clock we went ashore. I believe A. was the only one who remained on board. He prophesied intolerable sand flies and heat for us, but we found neither.

The old queen, who was the last authentic relic of the ancient sovereignty, had died 24 days before, so there was nothing to see but the mission. The nuns gave us something they called lemonade—a mildly fermented sort of drink.

The shore was covered with cocoanut, breadfruit, and orange trees. There were no native houses, only 30 to 40 European-built wooden ones, and everything, except perhaps the mission, had an air of shabby decay. The island's population is said to have dwindled from 18,000 to 350. The missionaries, I understand, whether Catholic or Protestant, feel obliged to admit that as a rule they have been able to change the natives' lives in external form only. Clothing is worn and hymns are sung instead of savage songs; marriage is nominal, and underneath this everything is absolutely as it was in pagan times.

A little outrigged boat, with one man, had come out with a few bananas and "vees," a sort of small mango, pear-shaped, with a thin banana-like skin and a very juicy interior, having a mild pineapple taste. But this was the only thing good save the cocoanuts, of whose water we drank abundantly. We had been expected for long; our arrival was what might be called the great event of their year, but no one paid any attention to it. No one got anything ready to sell or came off to see the ship, except the man in the little boat, until just before we were leaving.

The natives wear European dress, when they wear anything, the women being in very gaudy French calicoes. The men, especially the elder, are tattooed, the effect being that of uniform bands of olive-greenish color across the face, rather than any design. One old lady, however, had her left hand and wrist elaborately tattooed, and I was told

Gathering Cocoanuts

that it was the hand with which she ate "poee." A boy "walked" up a tree and knocked down half a dozen cocoanuts, the milk of one of which I drank. I have tried to get some breadfruit cooked and some fresh fish; so far unsuccessfully. I have returned to lunch and am writing this on the deck, not meaning to return to the shore.

Four large boats are coming round the eastern point, sounding conch-shells and beating drums. They are from a neighboring valley and come, to the number of fifty or more natives, to execute a dance for our party, which I am not going on shore again to see. The 300 natives whom it was advertised the ship would take to Papeete have not appeared. We are told that they had made great preparations for going, but that the governor had changed his mind.

And Typee! The proprietor of the Typee Valley, Mr. G., is on board. He describes it as having two or three families living on it and some wild cattle, as containing two or three square miles, and as being five or six miles long. It must be much as it was in Melville's time, but without the inhabitants. The path to it, leading over the mountains, is visible from the ship It is a slow ride, two hours long, or about six miles from the harbor, although Melville wandered for days in getting to it. It is described as having the most considerable stream of the island running through it (but without the little lake Melville mentioned) and as being lined with ancient "Ti's."

The mouth of the bay where the Typee Valley enters the ocean and where Melville escaped, is visible from the ship, eight miles away, and the Happar Valley must be between us and it. So near—and we sail at 4!

Got, with Mr. K. (a merchant of Papeete and a passenger), a basket of beautiful fresh fish, alive, of varied colors—some pure crimson, some striped with green, etc. Mr. K. sent a man to get them, or we should have had none, the natives being too lazy to catch any.

We took on four horses which were swum out to the ship. It was curious to see the naked natives diving under the kicking beasts to attach the hoisting gear. We took on two or three Frenchmen and as many natives (instead of the 300!) and sailed at 5 o'clock.

July 7.—Nothing to record.

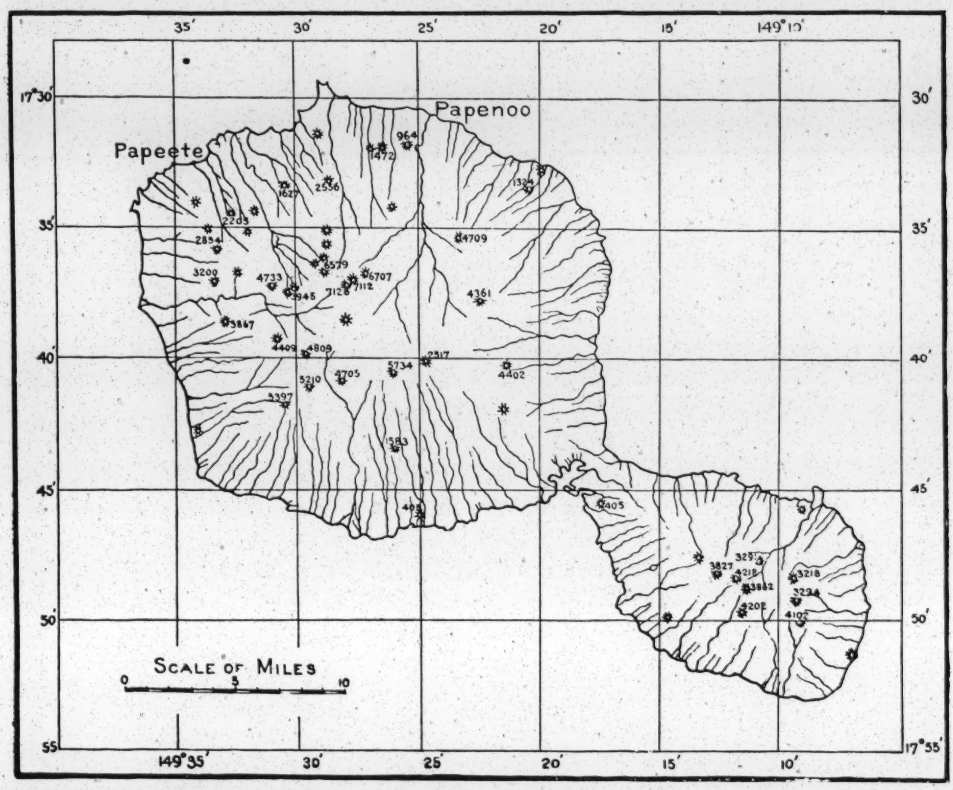
July 8.—After a somewhat rough night, a beautiful morning. The vessel (at 8) is passing an "atoll" some 30 miles long and, I suppose, 8 or 10 broad from rim to rim, the low beach being covered with trees, but a few of which are cocoa-palms. They say that the natives of these atolls have all the pearl-fishing in their own hands, the French government not allowing the competition of diving machines. The great gain is not in the pearls, but in the shells, which bring a hundred times as much profit, on the whole, being very large and worth in Tahiti about 90 cents in American money per kilo. They sell in London for £300 sterling the ton, so that for once the natives get a fair share of the profit, some of them making, in the best season, 30 or 40 Chile dollars (the Chile dollar is as large as our silver dollar, but passes for only 40 cents) a day at the opening of the fishing.

The greatest depth an expert diver can go is about 70 feet, and the extreme time he can stay under water is said to be a little over two minutes.

We are through with the dangers of the night, and are enjoying the prospect of landing tomorrow morning.

TAHITI

July 9.—We arrived off Tahiti early in the morning. It is a pile of mountains clothed with green to the summits, more than 7,000 feet high, with a narrow strip of low land between their feet and the sea, in which narrow space nearly



Map of Tahiti, showing the many rivers that flow from the high mountains in the interior.

all the natives live, the whole lofty interior being uninhabited. In the center is a fantastic group called "The Diadem," and opposite, 15 miles away, is a most picturesque island, Mourea. I take the first boat ashore and am rewarded by reaching K.'s store at 9.45 a. m., in time to order some clothes (to be done tonight) before every one has gone to his (French) breakfast, after which all business ceases for two or three hours.

The town is stretched along the shore, and has nothing of interest. It has no hotel, and no markets of any kind, except for the things which nature furnishes the natives gratis; not so much as fresh eggs are to be thought of, the only eggs being brought by our own ship from San Francisco.

The rest of the day is passed on the ship, while Mr. K., our general provider, and immediate agent of Providence, is trying to get horses and vehicles for an excursion around the island. In the evening he reports that he has gathered four or five conveyances, sufficient for a party of twenty to go around the island. That number join (two-thirds of the party being ladies), and I, seeing nothing else, join with them on the understanding that I do not go all the way around, but have a carriage to myself and leave at "the neck."

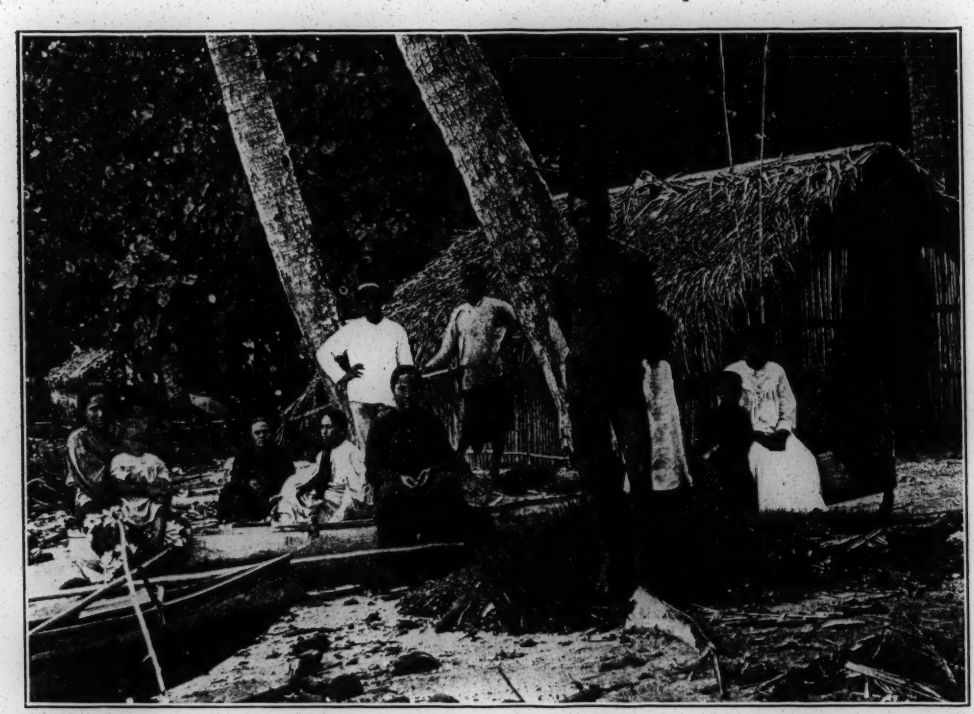
July 10.—The party starts from K.'s store at about 9. Mr. K. has sent

couriers around the island, both ways, to announce our coming to the chiefs who are to provide for us.

We pass through sugar plantations, and go by Mr. K.'s country place. On his lawn, between his house and the Pacific, are two old sacrificial stones. He says he is sure of finding plenty of human bones there when he uncovers the site. We go on by a delightful shady road close by the sea, till, at 12.30, we stop at Papenoo for a native breakfast. The principal dishes are (1) breadfruit cooked (baked) in leaves. It cuts like soft, very fine cheese, and I can hardly define the taste, but it is mildly pleasant. (2) Young pig, fed exclusively on cocoanut. It tastes half cocoanut, half pig! It is eaten with a sauce of sea-water, lime, and cocoanut juice. (3) Fish. (4) Oranges, cocoanuts, and other fruits. (N. B.—Cocoanut water and Bordeaux mix very well.)

The pigs, mostly little black creatures, appear to have been left by the Spaniards 300 years ago, and to be the only animal known to the island, and the only quadruped known to the older natives. Pig ("pua"), then, has become the generic name for animals; thus, a horse is *pua horo*, "the pig that runs over the ground," man (as an edible) is *long pig*.

The native women sing "himinies" with some very striking effects. The voices have something plangent and metallic in them, yet are melodious and in harmony. In the first song, at the end of each verse, all stopped suddenly, giving the effect of the "couac" of the opera singer. In all the verses there was an undertone beneath the song. This undertone continued alone for a few seconds at the end of each verse, after the superposed song was finished, and died out separately and slowly, like



Robinson Crusoe Hut

the drone of some great bagpipe. The natives gave names to each of us, mine being "A-to-hi," which means "qui a les lauriers."

The place where we breakfasted (at Papenoo) was a semi-European house belonging to the chief of the district. It was a large one-story shed-like building. We left at about 2 o'clock, and traversed a still more lovely embowered road, with the sea dashing on the rocks within a rod much of the way. The land and the rocks were covered with verdure, this green meeting the open ocean without any intervening beach. We forded stream after stream, until my jaded little rats of horses gave out in the middle of each and had to be helped on.

I had taken the lead, so that the procession could not get on without helping me forward to clear its own way. The ride was prolonged until the anticipated two hours became four; the fords grew worse and worse, and I, for one, was well tired when, just after six o'clock, and in the twilight, we arrived at another chief's, who had a large shed of three rooms, with the floor covered with beds. Most of the houses, however, were "Robinson Crusoe" huts, neatly built of upright bamboo. The natives are wilder than those near Papeete. The men are often naked, except for a loin-cloak of gaudy calico, no dress of native cloth (tappa) being, as a rule, worn by either sex.

We supped much as we breakfasted, except that I was instructed in the proper way of eating "Poee," the clinging plastic mess of starch-like consistency which so clung to Melville's fingers in Typee. The secret is simple—imitate the native, who puts his fingers in water first, then in the "Poee," and then sucks them dry. I chose to sleep out of doors on a mattress in the wagon, amid the cocoa palms, the passing forms of the natives, and the lights from the cooking fires. The novelty of the situation kept me awake a good deal. The nearby surf sounded in my ears all night, and the sea breeze was so cool that I drew my rubber overcoat over the coverlet for warmth.

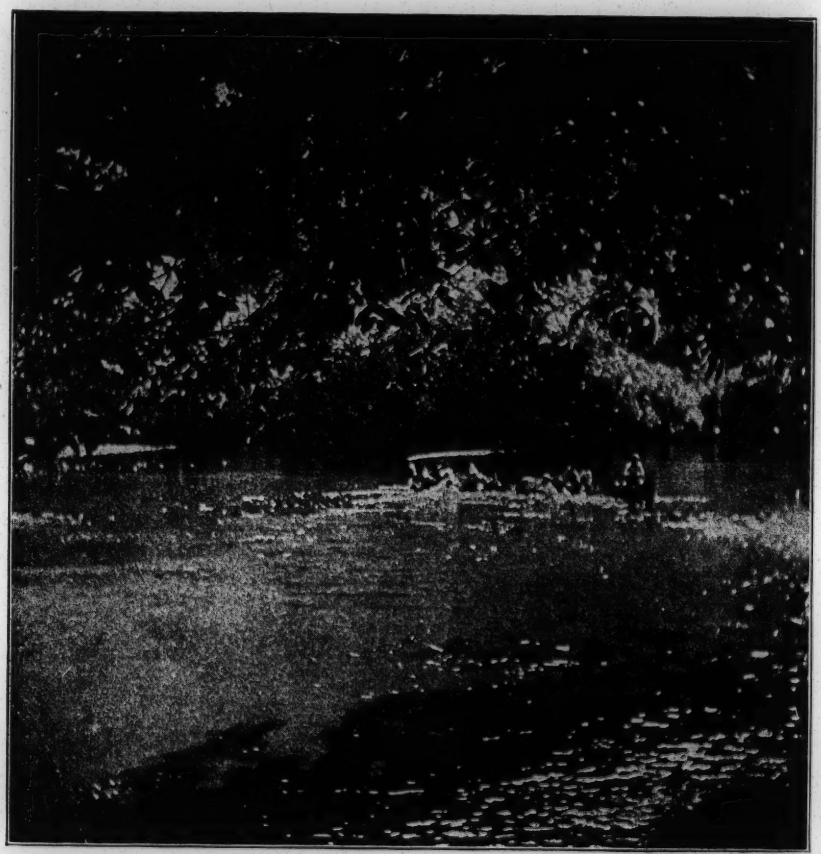
July 11.—I awoke with the noise of the natives in the early morning twilight, and went down to the beach. This was covered with rough stones and shell heaps, which made walking difficult; but I got into the water and let the Pacific roll over me, and going back just as the sun arose, ate one of the oranges from the trees about me like a simple savage!

After breakfast we moved on, over roads and through rivers which grew increasingly difficult for about ten miles. This is the wild part of the island. The road grew in places too narrow to let a wagon pass quite in safety between the cliff on the right and the sea, and finally we came to a river which was five feet deep opposite the place where we entered it.

Turning down the river we drove in it to a ford where the water only just covered the floor of the wagon, and then turned up the stream again to where the landing was to be made, and here was the tug, to get over the fallen trees which encumbered the stream, and up the steep bank. The horses struggled, the natives filled the water with their heads and brown bodies, tugging at their horses' heads and lifting the wheels; some of the wagons filled, and some of the ladies were carried ashore on the backs of the islanders. We all got safe ashore, but it was lively while it lasted.

When we got to "the neck" the main party went on and I turned back to go down the civilized side of the island, over bridges and a good road to Tati's.* I got to Chief Tati Salmon's house about 2.30, where I was

* Chief Tati Salmon, the head of one of the oldest families and most considerable chiefs of the island, is so public a character that I need hardly apologize for mentioning his name and his hospitality here.



Crossing a Ford

Landing

warmly welcomed. I lay down and slept till near dinner time. Then I dined in state on the portico with Tati and his two sons. Our dinner was of soup, fish, dressed in native style, with cocoanuts, shrimps, and I forget what else.

The manner of these sons was very good, and to their father it was most respectful. I noticed a pretty cover on a table, which Tati said was a chief's mat. He offered to get one for me.

Tati, whom I had met in Washington, is the son of a native mother and a white father, and his family, a very ancient one, is still one of the most prominent, as he is one of the best educated and most intelligent, of the islanders. He mentioned to me that the chiefs were much at war in his great-grandfather's time, and that the object being to get the heads of their enemies, these were cut off and buried by the relatives of the dead in some secret place. Tati said also that the heads of some of his own family were buried in a place in the mountains, whose position he only approximately knew, the secret of the exact locality being kept by some old member of the clan. I have heard from others that his great-grandfather had large ideas of housekeeping. There is on the island a pitcher plant holding two or three tablespoonfuls of water; and, according to tradition, the old chief occasionally had a thousand men or so marched up in the morning, each with a pitcher plant stuck in the right ear, and the emptied contents formed the great man's bath.

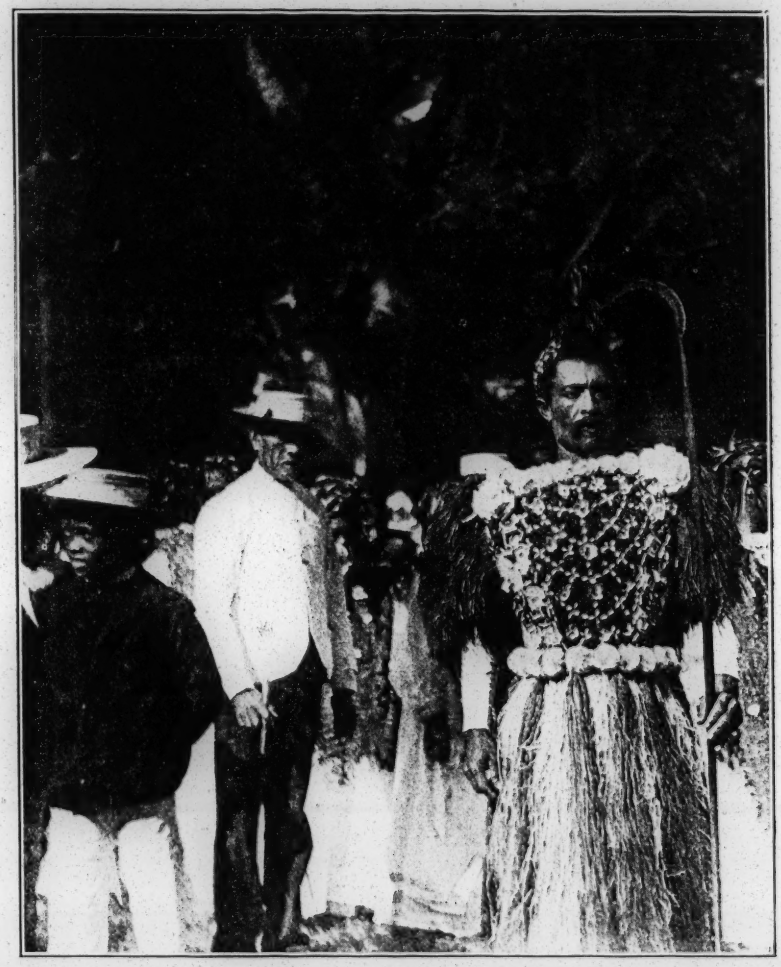
After dinner I opened a topic which proved interesting to us all, the "supernatural" of the island. We talked for two hours, and I heard of the "fire-walking." One of Tati's sons said that he, at a fire-walk given in Tahiti three years before, having on shoes, had followed the barefooted priest over the "red-hot" stones, and that his shoes were not burned in the least.

July 12.—This morning I started at 8.30 and drove to Papeete, stopping for a bath in a stream, and getting in at about 2; breakfasted at the execrable restaurant, went to the ship, and then came to Apouhara Salmon's, a son of Tati's, where a room had been procured for me. Here I spent the afternoon. Just opposite is a large open space where the natives congregate with drums and sing "himinies" in preparation for the fête, and the place is not silent! Apouhara had gone out in the morning to meet me, but missed me on the way. I saw his wife, who is the daughter of the queen of a neighboring island, and Miss Salmon, Tati's sister, a very intelligent and agreeable lady.

July 13.—Drove out alone this morning to the Fatoua stream, described in Loti's "Rarahu"* as the bathing place. The pools he mentions are gone, I am told, but I drove up the side road along the bank of the stream for at least two miles, and came to a long, deep pool, shaded by trees and high hills. It is about 200 feet long and over head in the middle. The water is just cool enough, an ideal bath. As we rode back, I got some fresh cocoanuts from the trees, and drank all the water from one of them, eating part of the snowy cup. Oh, the pleasant memory!

I came back to Apouhara's, when I met Tati's son, who had taken part in the former fire-walking ceremony. I asked him to breakfast with me at the "Hotel du Louvre," which he did. There I saw a copy of the *Wide World* of June 1, containing an illustrated account of the recent fire-walking ceremony in Honolulu, conducted by the old native priest, Papa-Ita, a man of about sixty years of age, who is in town, and to whom young Tati introduced me. He is not the high priest (who lives in one of the Windward Islands), but a disciple, and he says he will give an ex-

* Pierre Loti, "Rarahu," 1880, reprinted 1882 under the title "Le Marriage de Loti."



Cook Island Chief

The Road to Point Venus

hibition here on Wednesday. I offered to pay for the wood for the fire, if necessary. The old man says he could teach the art in about a month. It consists, as I understood, in mystic rites, but there is no physical anointing. The prophet said he was going to pray for the next two or three days, and I sent him to his home in my carriage.

I went on board the steamer and told the captain, the ship's doctor, and U. S. Consul Doty of the prospective exhibition. Apouhara says that when Papa-Ita was here in 1897, any number of the people (15 or 20) followed the priest through the fire. When all are through some one calls, "All out," and the priest turns around and marches back again. If he turns and looks back before all are out, those still there will be burned!

Arranged with a French livery-stable keeper for a horse and carriage tomorrow.

July 14.—A wretched horse and carriage came, and I went to the Fatoua Pool and had another delicious bath. Came in and went to the ship, where I saw Mr. K., and spoke to him about the fire-walk. He attributes the "miracle" to the natives' horny-soled feet, but does not explain how tender feet of Europeans are not burned.

Paid extravagant bill at the wretched "Hotel du Louvre," and arranged to take subsequent meals on ship. Mr. K. promises to get me a two-horse team, and to send "Frank" around today at 1 o'clock, if he can find him, but he has not come. (Today is the French 4th of July and the occasion of the government fêtes to which the whole island has come.)

July 15.—Went out to the public dancing and singing, in competition for prizes offered by the government. It takes place in the square before the government house, and everybody is there, either performing or looking on. Almost the whole population of the island has come.

The chief interest among the islanders seems to lie in the competition of singing "himinies," and next to that, in the dancing, which is pantomimic as much as regular. As a public show, most of the native dances are unpresentable, so that, I have understood, the authorities have had some difficulty in finding a dance which will do for such an occasion. Savages are here from the neighboring islands, a fine-looking chief from Cook island taking a part, and a woman from the same island gave a little of the presentable part of the "Hoola Hoola." Her body would be quivering like a jelly, and suddenly grow rigid as a statue—a notably odd effect.

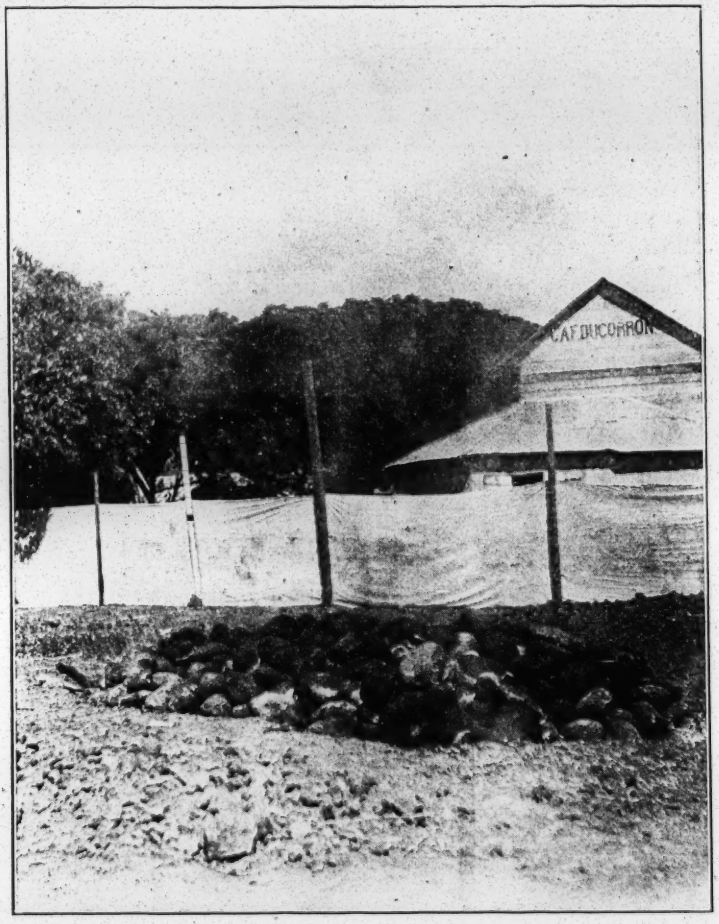
In the afternoon there were regattas, the most interesting one being the rowing of one of the ancient double war canoes, or a modern duplication of it. There were 42 rowers, or rather paddlers, and they got up a "spurt" of speed which I estimated at about seven miles an hour. On this afternoon we sat on the deck and watched the wonderful sunset behind the fantastic peaks of Mourea. It would have been a time to quote Byron—

> "Slow sinks more lovely ere its course be run
> Along Morea's hills the setting sun."

only that the tropic sun does not descend slowly.

Frank, my driver, came at 1 o'clock with the old carriage and one horse. I drove Mrs. K. out to Point Venus,

Cook Islanders



The Pile of Stones Ready for the Fire Walk

and saw Cook's "meridian" stone. Frank says his own family and their ancestors have always lived near here, and that their traditions say that Cook's vessel was first seen by the natives from this point, and that he landed here. In the evening the whole Apouhara family went out, leaving me to keep house.

July 16.—More "himinies" in morning. In one very good dance by the Cook islanders over thirty persons take part. They sit down in three rows, representing rowers in a canoe, while two scull and steer. They have paddles, and paddle to the sound of drums. A lookout man sweeps the horizon till he sees a big fish, and the canoe rows for him. One of the steerers sharpens a harpoon and passes it forward, and the fish (a man dressed in red) is harpooned. There is a tremendous time in pulling him in; he runs around and entangles the line among the bystanders, and finally he gets a second harpoon in him, is hauled on board, and (in pantomime) cut up with an ax, dismembered,

and eaten by the crew. Everybody is in motion, but it is rather a pantomime than a dance.

I went and had another glorious bath in the Fatoua Pool and came back in time for lunch.

THE FIRE WALK

In the afternoon I went over to see preparations for the fire-walking. Within a hundred yards of the ship a shallow pit is dug (not apparently oriented to any point of the compass), about 9 feet by 20 feet by 18 inches deep. This is to be filled with firewood, and the stones heaped on the wood. These are smooth, water-worn, volcanic stones of varying size, but all rather large and weighing, at a guess, from 15 to 50 pounds. The number of the stones was about 200, and their average length about 15 inches.

Old Papa-Ita says that a woman who lived there long ago and who died and became a devil (or goddess) is the one to whom he prays and by whose mediation he passes unhurt through the fire.

"The aids began to turn the stones over with long green poles, which burned at the ends."

Papa-Ita, . . . with a large bunch of Ti leaves, . . . began to walk through the middle rather hurriedly

I have spoken to several respectable natives who separately walked through it after him three years ago here, who all agree that they felt little heat on their feet, but a good deal on their heads, their ears, and their hands.

July 17.—This morning arranged to pay $6.30 (Chile) for five dozen fish, which were delivered early and put on ice; then went with Mrs. K. and bought the best shawl to be obtained in town for Mrs. Apouhara; paid for the chief's mat and other things which Tati had ordered for me, and then left my lodgings for the ship. I bathed for the last time in the Fatoua Pool; called on the governor and left my card and Ambassador Cambon's letter, getting an answer from the governor promptly, with an invitation to call at 4 o'clock, which I was obliged to decline on account of the fire-walk at that hour.

In preparation for the fire ceremony, I took a tin ship's measure full of fresh water, which held very nearly 5 quarts and, by weight, 9.2 pounds. The empty tin weighed 1.1 pound. This is to be used in half-filling, with three or four measures, a large wooden bucket or tub with fresh water, into which one of the smaller hot stones from the center of the fire is to be put after the ceremony.

I am told that the fire was lighted at a little after 12. I arrived, with Captain Lawson, Dr. McNulty, Chief Engineer Richardson, and two assistants. The wooden bucket, containing 3½ im-

perial gallons of fresh water at a temperature of 20 Reamur (77° F.) was provided, together with iron rakes from the engineer's room. The firewood was scarcely sufficient for a good heating; the stones in the center and beneath were, however, undoubtedly "red-hot." The outer enclosure, surrounded by canvas walls, was about 120 feet by 60 feet.

Mr. Ducarron, the U. S. Deputy Consul, says that Papa-Ita tried to carry on his exhibition in another island at the base of a hill composed of hard limestones, from which he exclusively used stone. (This was in Raiatea).

The fire there, I am told, invariably burned for 4 or 5 days before, and the stones became coated with lime. I learn that on one occasion, the French authorities having forbidden him to perform in his usual place, he made the "oven" of other stones, heating them for 36 hours. On attemping to cross, he walked only part of the way and ran the rest. His two disciples and a woman also ran across, and the woman's feet were so badly burned that she was laid up for a week. The prophet and his disciples declined to have their feet examined, and cleared out of sight. For corroboration, Mr. Ducarron says I may refer to M. Rousselot (address, Ministère des Colonies, Paris).

NOTES TAKEN ON THE SPOT WHILE THE PERFORMANCE WENT ON

At 4.40, when the priest came in, the stones on the side of the pile would bear to be touched by the hand.

The aids began to turn the stones over with long green poles which burned at the ends. The upper stones were none of them red-hot on top; the lower ones, two layers deep, however, could be seen to glow between the others, but they were only near red-hot in the center.

The old priest, Papa-Ita, beat the near stones with a large bunch of Ti leaves three times, and then began to walk through the middle rather hurriedly, followed by two acolytes, who appeared to shun the hot central ridge, and walked along the sides. Then he walked back, followed by several; then back once more with an increasing crowd, most of whom avoided the center. The horny-footed natives did the best. One white boy took off his shoes, but could not stand the heat upon his bare feet, and stopped. At this point (*i. e.*, after the second passage forward and back), I had the hottest stone of the pile in the center, on which the feet had certainly rested several times, hauled out and placed in the water bucket. The stone was much larger than I had reckoned or wished. A trifle of the water was spilled by the plunge, and the rest boiled hard and continued to do so for about 12 minutes. At the end of that time the stone was still too hot to handle, and I sent to the ship for a sack to hold it, directing the remaining water to be measured. It was a long stone; the lower part had been immersed in the central fire, and it was certainly much hotter than the average center stones. During this time other persons walked over the stones without special preparation, the disciples still dodging the hot central line and following near the cooler part. I asked Papa-Ita if he could take upon his hand a small hot stone near the center. He said he would, but he did not. Next many white persons walked over, stopping long enough to lean over and lightly and quickly touch the hottest stones with their hands. Mr. Ducarron walked to the center and stood there shifting his feet (he had on thin shoes) from stone to stone for about 10 seconds before finding it too hot to stay.

After this the outer crowd was allowed to come inside the barrier. It was a capital exhibition of savage magic and well worth seeing, but no miracle!*

*See Nature, August 22, 1901.

July 18.—We left at 10.30 a. m., the ship's upper deck being hung with bunches of bananas. As we went out of the harbor we passed wonderful green-yellow water inside the barrier reef, and we went over to the Island of Mourea (described in Melville's Omoo) to give the passengers a chance to visit it on the side not distinctly seen from Tahiti. It is very irregular in outline, with much finer cliffs than on Otaheite, and has one or two beautiful bays said to be good harbors. I understand that it would not be difficult to secure the whole island for a small sum.

We turned and went northward, bidding a good-bye to Tahiti and its "Diadem," which we are never likely to see again.

July 19.—The vessel rolls a good deal. The temperature is pleasant.

After lunch, weighed the stone which I got from those used in the fire-walk. It weighs 65 pounds, is about 15 inches in its longer diameter, and displaces 3½ imperial gallons of water. After weighing, it was thrown overboard, a piece having been broken off to take home with me.*

July 20–24.—On the 23d the sea almost glassy, reflecting the clouds.

On the 24th the smoke ceases to blow southwest from the funnel, and blows nearly south. The weather is still warm, but shows signs of getting cooler.

On the 25th, I think, or some later day which I did not note in my diary at the time, the whole sea around the ship seemed to be animated with spouting whales. We could see them at a distance as they rolled or played; and once a great shining black back, 20 to 30 feet of which was out of water, came directly toward the quarter of the ship, and was so near that we could have thrown a stone on it, when, apparently catching sight of the vessel, Leviathan dove, and made "the deep to boil like a pot," leaving a quarter of an acre of foaming ocean where he had gone down.

The diary does not appear to have been kept up for the next few days, which were pleasant, but uneventful.

In the early morning of the thirtieth of July we waited in a dense fog, and then moved slowly in through the Golden Gate, and reached the dock at San Francisco at about one o'clock.

* When I reached Washington I found it to be so porous that its specific gravity was but 2.39 and so non-conductible that a small fragment could be held in the fingers like a stick of sealing wax while the other end was made red-hot in a blow-pipe. This non-conductibility is evidently the principal cause of the success of the fire-walk "miracle."

THE LOST BOUNDARY OF TEXAS

By Marcus Baker, Cartographer, U. S. Geological Survey

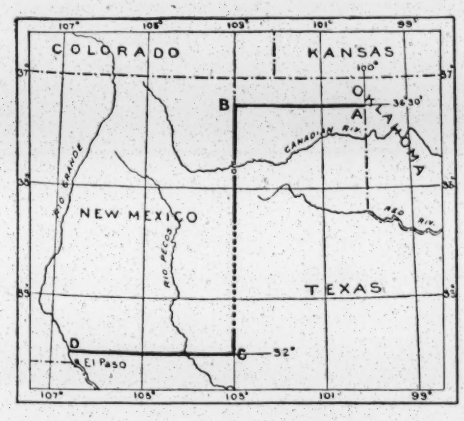
THE law makes the 100th meridian of west longitude the boundary between Oklahoma and the panhandle of Texas. Similarly the law makes the 103d meridian the boundary (in part) between New Mexico and Texas. Recent government maps do not so show these boundaries, but place each one a little west of the meridian with which, by law, it coincides. These discrepancies have led to an inquiry as to the cause and as to our present knowledge of these boundaries.

These and similar boundaries are established as follows: *First*, Congress enacts what the boundary shall be; *second*, the boundary is surveyed and marked in conformity with the law, and, *third*, the survey is confirmed. When all this has been done, the marks set by the surveyor become the boundary. Even if subsequent surveys disclose inaccuracies in the original survey, as it invariably does, nevertheless the monuments originally set, although inaccurately, remain the boundary. Permanence and certainty are of more moment than refinements of accuracy.

If the accuracy of a later and more refined survey was a sufficient warrant for changing a boundary once established, the later survey would itself be subject to like change when itself followed by a survey of yet greater refinement. Thus would result the intolerable nuisance and menace of a shifting boundary. The rule and the reason, therefore, unite in declaring that subsequent surveys are powerless to alter or to fix boundaries. Boundaries become established by mutual confirmation, such confirmation being either formal or presumed from long, notorious, and undisputed acquiescence. It is not the surveying or marking done by the surveyor which establishes a boundary, but the acceptance and ratification of such survey by the parties. If neighbors dispute about their line fence, a surveyor is powerless to settle their dispute without the consent of both. This power to settle vests in the courts, which receive and weigh not only the testimony of the surveyor, but all other evidence pertinent to the dispute. Neglect of these obvious principles lies at the bottom of much boundary contention.

The boundary along the 100th and 103d meridians originated in 1850. In 1835 Texas declared her independence of Mexico, and on December 29, 1845, was admitted to the Union. It then comprised parts of territory now included in New Mexico, Oklahoma, Kansas, Colorado, and Wyoming. In 1850 Texas sold to the United States for $10,000,000 all her territory north of latitude 36° 30′ and west of the 103d meridian as far south as latitude 32°. In the act of Congress of September 9, 1850, effecting this purchase, the boundary here considered first appears. That act recites:

"The state of Texas will agree that her boundary on the north shall commence at the point at which the meridian of one hundred degrees west from Greenwich is intersected by the parallel of thirty-six degrees thirty minutes north latitude, and shall run from said point due west to the meridian of one hundred and three degrees west from Greenwich; thence her boundary shall run due south to the thirty-second degree of north latitude; thence on the said parallel of thirty-two degrees of north latitude to the Rio Bravo del Norte." (See the line A B C D of the accompanying figure.)



CLARK'S SURVEY

About eight years later provision was made for running and marking this boundary by commissioners on the part of Texas and the United States. Mr. John H. Clark, who had had previous experience as an astronomer and surveyor in the "Far West" of antebellum days, was chosen early in July, 1859, as commissioner and surveyor on the part of the United States, and Mr. William R. Scurry on the part of Texas.

It was agreed that the survey should begin at the intersection of the 32d parallel with the Rio Grande near El Paso (D of Fig. 1), proceed east on that parallel to the 103d meridian (C), thence north on the 103d meridian to the northwest corner of the panhandle (B), and thence east on the parallel of 36° 30′ to the 100th meridian (A). With some modifications, due to lack of water and difficulty of travel, this plan was carried out in the years 1859 and 1860.

The station Frontera, of the Mexican boundary survey near El Paso, was accepted as the starting point for longitude, and its longitude transferred, by chaining and triangulation, about a dozen miles northward to the 32d parallel. The party then chained eastward along the 32d parallel for 211 miles, the calculated distance to the 103d meridian, and there set a monument (C). Its longitude was not then nor has it been since checked by astronomical observations. Having set this corner monument, the party started northward, but, owing to the total absence of water, were compelled, after proceeding about 20 miles and setting two monuments, to leave the line and go in search of water. Clark thereupon decided to ascend the Pecos River and measure offsets to the boundary; but the distance proved so great that he gave this up and proceeded to the northwest corner (B) and set about carefully determining this important corner. An astronomical camp was established in its vicinity, on Rabbit Ear Creek, and while engaged in observing with zenith telescope for latitude and moon culminations for longitude a surveying party was sent north about 35 miles to the 37th parallel to transfer the longitude found by Clark, in 1857, on that parallel southward to the parallel of 36° 30′. This was done, and the northwest corner post of Texas (B) established as to its longitude by transfer from the 37th parallel, and as to latitude by independent astronomical observations. Of the astronomical observations made by Clark to check this transfer no use has ever been made. This done, Clark ran southward for 156 miles, chaining the distance, checking by sextant observations, and building mounds or monuments to the number of 23. He then closed work for the season. The result of this season's work of 1859, so far as concerns the 103d meridian, was as follows: Monument set at the south end, fixed in longitude by chaining about 2.5 miles from Frontera, on the Rio Grande, without astronomical check; monument set at north end, its longitude being derived by transfer 35 miles from the 37th parallel, the longitude on that parallel being based on moon culminations observed in 1857; the running of the line northward from the south end 24 miles and erection of two

monuments; the running of the line southward from the north end 156 miles and erection of 23 monuments, leaving 130 miles between unsurveyed and unmarked.

SURVEY OF THE NORTHERN BOUNDARY

In the following season Clark began work on the 100th meridian, where it crosses the Canadian, and accepting, as directed, the monuments set there by Jones and Brown in 1859 to mark the 100th meridian, prolonged the line northward to latitude 36° 30′, and there built a monument (A) to mark the northeast corner of the panhandle. To check this position he prolonged this 100th meridian northward about 35 miles, to the 37th parallel, and found that the longitude of the northeast corner of Texas on the 100th meridian, according to Jones and Brown, was about 1,700 feet east of the 100th meridian, according to his own determinations on the 37th parallel in 1857.

He then ran west on the parallel of 36° 30′ till forced to leave the line for water. Then he went to the west end and surveyed east till he reached the point where the earlier work ended, thus finishing it. He then disbanded, returned to Washington, and proceeded to work up the results, draw the maps, and make final report. The great war cloud was then hanging over Washington; there was great impatience to close up this work; there appears to have been friction over seeming slowness in finishing up. Accordingly the work was abruptly stopped, unfinished, in January, 1862. So it remained for 20 years. In January, 1882, the Senate by resolution called for Clark's report. The result is a document of 309 pages of field-notes, correspondence, maps, etc., which, while giving much information, leaves much to be desired.

DISAPPEARANCE OF MONUMENTS SET BY CLARK

On March 3, 1891, Congress confirmed Clark's survey of the 103d meridian and of the parallels of 32° and 36° 30′. *Of the 26 monuments set by Clark on the 103d meridian, only two have been reported to the General Land Office.* These are on the banks of the Canadian River. The surveyors, Taylor and Fuss, who connected the public land surveys of New Mexico with these monuments, recognized them as boundary monuments, but made no determination of their longitude.

The initial monument at the northwest corner of Texas has been sought for by subsequent surveyors but without success. Mr. John J. Major sought for it in 1874, failed to find it, and "reëstablished" it, setting a new one, which there is excellent reason for believing is more than two miles *west* of the Clark monument. Mr. Richard O. Chaney, in 1881, set another monument at the theoretical northwest corner of Texas, and this without finding either Clark's or Major's monument. Based upon these and other surveys not here mentioned, the Land Office has concluded that Clark's 103d meridian was laid down between 2 and 3 miles west of its true position, and it is so shown on the Land Office map of New Mexico, 1896. After examining with some care the information on the subject now available, I am of opinion that this conclusion is not sustained by the evidence, and that until the longitude of some monument set by Clark has been telegraphically determined the boundary line should be shown on maps as coincident with the 103d meridian.

It is very desirable that this boundary be resurveyed, old monuments restored, and additional ones erected, before the discovery of oil or mineral shall provoke a boundary dispute.

ICE CAVES AND FROZEN WELLS

A NOTEWORTHY contribution to an interesting topic appears in the August number of the *Monthly Weather Review* (issued October 31, 1901), under the title "Ice Caves and Frozen Wells as Meteorological Phenomena," by H. H. Kimball, of the U. S. Weather Bureau (vol. xxix, pp. 366–371, pls. I–III). The paper is partly a compilation, partly a record of observations on the widely known Brandon well and at other localities; it may be regarded as a supplement to the book on *Glacières, or Freezing Caverns*, published in 1900 by Edwin Swift Balch. The well-known ice caves, and some not so well known, are described critically, with due attention to actual temperatures and to seasons; and a few ice wells are similarly described. The popular idea that the ice accumulates in summer and disappears in winter is rejected in toto; and the author concludes: "It is evident that ice caves and frozen wells are but different manifestations of the same phenomenon. In both cases the cold air of winter circulates to unusual depths below the surface, and freezes the small quantity of water with which it comes in contact. In summer this subterranean circulation of the air ceases, and heat finds its way to the ice only by the slow process of conduction. In consequence, the ice that accumulates during the winter and early spring may not entirely disappear during the following summer, but continue to accumulate for ages."

It is greatly to be regretted that recent writers on ice caves and frozen wells have not extended observation to the "blowing caves," "breathing wells," and "whistling wells" found in various parts of this and other countries, and sporadically recorded in ephemeral literature; for the physical laws exemplified in these are alike, and presumptively connected with those revealed in glacières and ice wells. The fact is too often overlooked that the normal or ordinary cavern is a "breathing cave," in that air currents flow alternately in and out with a degree of regularity conditioned by many factors, among which varying atmospheric pressure is the primary one. The strength of the "breathing" depends on the relative sizes of the opening and of the subterranean vault or chambers; when the mouth is small and the cavern large, the inspiration may be strong enough to suck in dead leaves or sway overhanging branches, while the expiration may suffice to send dry leaves high in air or blow off the hats of incautious visitors; though when the aperture is large or multiple and the cavern small, the current may be barely perceptible. The regular breathing is diurnal, lagging behind the daily range of the barometer by minutes or hours, according to the relative dimensions of orifice and vault; though the diurnal rhythm is modified and sometimes obscured by more general changes in atmospheric pressure, and also by temperature conditions. In cavernous limestone regions where winter snows lie deep, cave-hunting boys soon learn to find hidden orifices and to estimate the magnitude of the caverns by the vapor columns emitted on frosty mornings after a snowfall followed by the customary drop in temperature, the steam columns sometimes rising hundreds of feet in a density rendering them visible for miles. The "blowing well" is the homologue of the "breathing cavern," save that the subterranean vault is replaced commonly by a porous stratum or formation, usually coarse sandstone or granular dolomite; though it is possible that some such wells penetrate or communicate with open fissures or extended crevices in

the rocks. There is a region of blowing wells in southeastern Wisconsin, where the Calciferous beds of the Silurian rest on the coarse-grained St. Peter sandstone; another is reported in central New York, where impervious strata overlie the pervious Potsdam sandstone; still another occurs in England, where it received attention a few years ago in connection with water-supply inquiries; while sporadic examples are by no means uncommon elsewhere.

Now it is evident that when the barometer is high in a region of caves or breathing wells, the subterranean chambers or pervious beds will gradually fill with the slightly compressed air, and that the process of filling will be accompanied by inspiration, or in-blowing, through the open mouth; it is equally evident that with the subsequent fall of the barometer the imprisoned air will expand and force itself outward through the mouth of the cavern until the pressure within and without is brought into balance. Furthermore, it is evident that the air expanding in the throat of the orifice will abstract heat from surrounding substances, precisely as it does in the expansion chamber of an atmospheric ice machine, at a rate and to an amount varying with the pressure-difference; and hence that (provided other conditions be favorable) the moisture on adjacent surfaces may be congealed. In short, under favorable circumstances the breathing well or blowing cave may become a natural ice machine, clumsy and inefficient, indeed, yet possibly making up in magnitude for its simplicity and the slightness of the pressure-differences within its reach. Of course it would seem at first sight that in each passage from low pressure to high and back again, as in the long run, the effects of the natural mechanism would balance—*i. e.*, that the heat given off in inspiration would equal the chill of expiration, so that no refrigeration could ensue; yet when the seasonal ranges of barometer and thermometer are considered, it would seem clear that the heating would tend to culminate in autumn and the chill in spring, in such wise as to sustain the widespread popular opinion on the subject—*i. e.*, that the period of ice-melting runs into winter and that of ice-forming into late spring and summer. In any event the discussion of glacières and freezing wells cannot be regarded as closed until the related phenomena of blowing caves and breathing wells receive exhaustive study.

W J McGEE

WESTERN PROGRESS IN CHINA

MINISTER CONGER has forwarded the State Department a translation of the preliminary resolutions adopted by the recently organized Board of National Administration of China. The purpose of the Board is to institute reforms in China of a more moderate nature than the sweeping reforms proposed in 1898 which brought on the Boxer troubles.

"The things of the West are genuine; those of the Chinese, for the most part, are shams. The speech of Western men is reliable; that of the Chinese largely false," say the Board, and in this spirit of Chinese modesty and humility the resolutions were written. The following extracts are taken from these curious resolutions to show the nature of progress thus far made:*

"The first thing necessary is to manifest resolution like an upright pillar;

* The resolutions are published in full in the Consular Reports for October 28 (no. 1173).

then may one accomplish the splitting of the bamboo—*i. e.*, the difficult task. The Book of History says: 'Hold fast the golden mean.' And again, 'Only with decision of character can there be completion of a work.' These words sum up the case. . . .

"In modifying the government, the most important things to be considered are two: In the first place, the old customs were good, but, having been in operation a long time, a great many abuses and obstructions have grown up. The administration of the law should be thoroughly reformed and restored to its early condition. In the second place, what is lacking in the Chinese law should be supplied by an admixture of Western law, so that in time we may gradually become wealthy and strong. . . .

"The object of the establishment of this Board of Administration is to promote the independence of China. China's weakness is due to her poverty. The strength of foreign powers is due to their wealth. Deliverance from poverty, therefore, is the very beginning and foundation of independence. But the commencement of reform ought not by any means to wait upon the attainment of wealth. At present China has but a slender thread of life—merely the loyalty of her people; and at a time when bands of brigands are spread abroad, mutually deceiving and inciting one another, if the very first thing done is to search the Empire for money, it will shortly be said that of the thousand benefits promised and the hundred ills from which men are to be delivered, not one of the former has been gained nor one of the latter removed. Such a method is a direct oppression of the people and will alienate men's hearts. Though you may have very excellent plans, they will be difficult to carry out. But let us first remove one or two of the abuses complained of throughout the Empire, and carry into execution one or two of the things most desired, and we will cause the people of the whole Empire to know that the reforms projected by the court really have in view the promotion of the prosperity of the people and the removal of the ills from which they suffer. . . .

"In all matters let there be a purpose to search out the facts, and afterwards every edict issued will operate like running water. Heretofore, there have been debts to the foreign powers unpaid; now there is the pressure of the indemnity, amounting to more than 20,000,000 taels per annum. How are we to obtain such a sum? There are but two roads to wealth—one is to increase the revenues [literally, 'open the springs'], and the other is to economize in expenditure. An increase of the revenues will be either too gradual to meet the pressing demand, or it will be a case of 'seeking money and incurring odium.' This, therefore, is not so good as practicing economy in expenditure. Economy in expenditure means nothing else than the discharge of useless troops and the saving of their pay, the discharge of extra officials and the saving of their salaries, the abolition of useless offices and factories and the saving of the money spent on them. Pay for soldiers, official salaries, and other expenditures are all the very flesh and blood of the people of the Empire. . . .

"In the south and east certain provinces have begun the adoption of Western customs, and say there is nothing to fear or suspect in Western methods. But the people of the north and west are simple in their habits; their eyes and ears have had no broad experience, and to abruptly order them to change their manners is no wiser than the sounding of a cymbal for a deaf man to hear or the endeavor to peel a water nut with a lotus stem. In reforming the customs, therefore, it is decidedly difficult to make a plan of universal adaptability which may be put in operation among all the people of the whole

Empire. The plan must be adjusted to the character of the locality and developed according to the circumstances and prosperity of the people. Moreover, in adopting Western methods, we must remember that there are differences in Western forms of government and in Western industries.

"If we desire to obtain the material benefits of their civilization, we must first learn their hearts. The hearts of Western men are interested in the public welfare, while those of the Chinese, for the most part, are devoted to selfish concerns. . . . Thus naturally the two races are very unlike, and in endeavoring to adopt their civilization we get no more than the outside. Though ten thousand men should join together in the effort and labor through a hundred years, it would be very difficult to complete the transformation.

"From the first year of T'ung-chih (1862) down to the present, there has never been a time when we have not talked of foreign affairs. Institutions and factories have grown up like a forest, and ships and cannon have outnumbered the clouds; yet in thirty years what effective change has been completed? The reason for our failure is that while among Western people in their undertakings a thousand men are of one mind to secure the prosperity of the state—and securing the prosperity of the state benefits individuals as well—among the Chinese, in their affairs, a hundred men have a hundred minds, each seeking his own advantage, and while some profit and others do not, the state does not obtain the least benefit. It is for this reason that shares are not sold and that corporations are dissolved. In undertakings which the foreigner finds profitable, the Chinese, in their endeavors to imitate, find nothing but losses to make good. The hearts of the Chinese must first be rectified, and then they may imitate the excellent methods of the West; but to straighten the foundations and to cleanse the fountain, this is not a task for one man."

GEOGRAPHIC NOTES

TAHITI

THROUGH the courtesy of Mr. S. P. Langley the NATIONAL GEOGRAPHIC MAGAZINE is able to publish this month the diary of his recent trip to Tahiti. The diary is published as it was written from day to day, without any alterations, and is an entertaining story of several weeks passed in a fascinating part of the globe.

Tahiti was discovered in 1606 by Quiros, who named it La Sagittaria. One hundred and sixty one years later Captain Wallis rediscovered the island and called it after his sovereign King George. The native name, formerly spelled Otaheite, asserted itself, however, and is now alone used. Tahiti was Captain Cook's favorite center when exploring the Pacific. It was on this island he observed the Transit of Venus on his first great voyage of exploration in the Pacific. English missionaries settled in Tahiti near the close of the eighteenth century, and for some years met with considerable success. France declared a protectorate over Tahiti and the Society Islands in 1842, and in 1880 formally annexed the group.

LITERACY OF THE MEN OF THE UNITED STATES

THE most literate element of the male population of the United States is the native white of foreign born parents. Ninety-eight of every 100 men, 21 years of age or over, who were born in this country of white foreign parents can read and write. A less proportion of the native white of native parents read and write—94.2 per cent—while not quite nine-tenths of the foreign born men and only a little more than half of the colored men can read an addressed envelope or write a receipt. The following diagram shows the reading and writing ability of American men of voting age in each element. There are 21,329,819 males of voting age in the United States. Of this great army of men 19,003,524 read and write and 2,326,295 are capable of neither—that is, of the total male population who are of voting age in the United States 891 in every 1,000 are literate and 109 are illiterate.*

* See Census Bulletin no. 106.

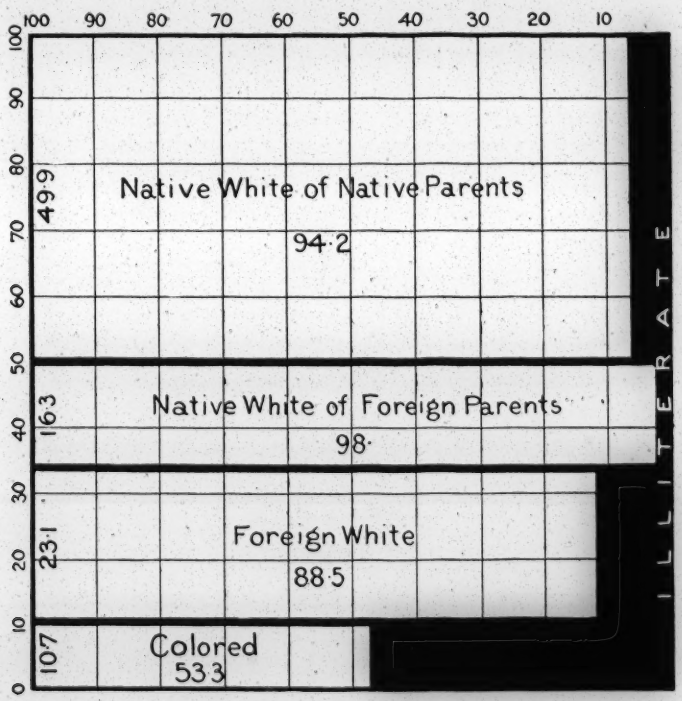
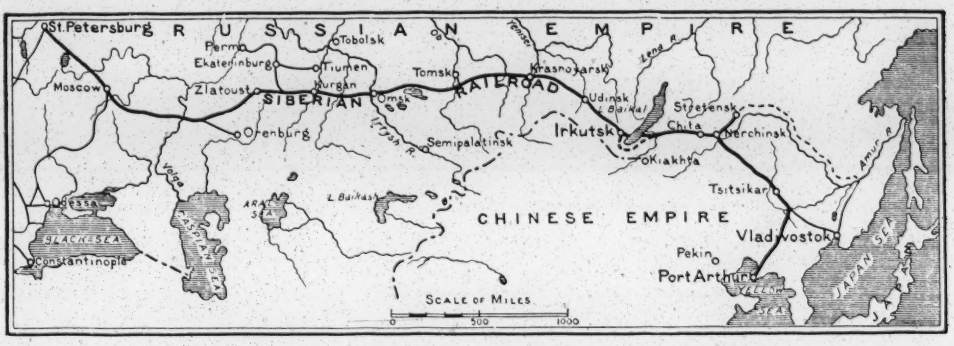


Diagram showing literacy of males 21 years of age and over in the different elements of the population

The diagram also shows the percentages of the different elements in the total male population that is 21 years of age and over



Outline Map showing route of Trans-Siberian Railway

TRANS-SIBERIAN RAILWAY

THE month of November marked the practical completion of the Trans-Siberian Railway. For Russia and Siberia the road has tremendous possibilities. It means to her vast Siberian territory the development and prosperity which the first belting of the American continent brought to the West. For Europe, especially western Europe, it means even more perhaps than to Russia. The road marks the inauguration of a new route to the Far East. The Siberian Railway will gradually supplant the Suez route, and make Russia, not England, the mistress of the world route to the Far East. An article that appeared in this Magazine in September, 1901, dwelt at length on the construction and meaning of this Trans-Asiatic railway. The Manchurian branch of the railway, with map, was described in the August, 1900, number.

ICE IN SOUTHERN LATITUDES

THE three expeditions now in South Polar regions will this season have to contend against ice extending more to the northward than usual. Mr. James Page, of the U. S. Hydrographic Office, sends to this Magazine the following paragraphs from the report of Capt. John N. Start, in command of S. S. *Star of New Zealand*, describing the icebergs seen during a voyage from Bluff, N. Z., to London:

"During passage passed icebergs as follows: September 6, 1901, latitude 53° 24′ S., longitude 142° 16′ W., passed a very large berg (over a mile long and over 600 feet high). Temperature of air, 37°; water, 41°. September 7, on the same parallel, between 140° W. and 135° W., passed 77 large bergs and numerous small ones, weather getting thick and dirty and ice very thick; kept ship off to N. N. E. September 8, latitude 51° S., longitude 131° 30′ W., passed 11 large bergs and numerous small ones. Air, 45°; water, 44. On the parallel of 50° 20′ S. and between 128° 30′ W. and 124° W. passed 10 large bergs and numerous small pieces. Temperature of air, 47°; water, 44°.

"Bergs were mostly of the table form, with sheer precipitous sides, showing clearly each stratum of snow in formation. In height they ranged from 370 feet to over 600 feet (height determined by sextant and distance). A number seemed of irregular shape, having been longer adrift and wasted by action of seas and heat. From the date last given no further ice was seen, the vessel making casting just north of the average ice-line shown on the chart.

"September 27, in latitude 20° S., longitude 30° W., between 6.30 and 7

a. m., we passed through a belt of whirlwinds 5 to 6 miles wide, extending to the horizon in either direction. Previous to this the wind had been blowing a moderately fresh breeze, varying from east to S. E., with rainy, dirty weather without any interval. The vessel passed into the belt. The whirlwinds were simply in hundreds and quite close to each other, so that the water was torn up into whirls in opposite directions every few feet, one blowing spray over the vessel on one side and another on the other side. The vessel passed out of the belt quite as suddenly into a fresh breeze from N. N. W. and the weather cleared up."

IN THE CANADIAN ROCKIES

A SUCCESSFUL exploratory trip was carried out last summer in the Canadian Rockies by Messrs. Henry G. Bryant and Walter D. Wilcox. The outfit consisted of fourteen pack and saddle horses, two experienced packers, and a cook, three tents and provisions sufficient to last two months.

Their main purpose was to explore and map a portion of the Rocky Mountains south of the Canadian Pacific Railway, between the Kootenai and Elk Rivers. This region is part of the main chain of the Rockies. It is about 75 miles long and from 25 to 30 miles wide, and had been hitherto unexplored, except for Captain Palliser's rapid journey over Kananaskis Pass many years ago.

The most important results obtained by Messrs. Bryant and Wilcox were the exploration and mapping of the upper part of the Palliser River and of the headwaters of several rivers flowing into the Elk, some important data about the Kananaskis Lake region, and the correction of errors in regard to the altitude and other details of the Kananaskis Pass. During the journey four passes were crossed and five large valleys explored, in the course of which a number of lakes and other interesting features were discovered, mountain ascents made, and a valuable series of photographs secured to illustrate the scenery and methods of travel. A small collection of fossils and stones was made for the benefit of geological knowledge of the region, and a set of panoramic views and roughly triangulated points will provide material for a new map of this very picturesque and interesting part of the Rockies.

An article by Mr. Wilcox, describing the work done and illustrated with maps and photographs, will appear in an early number of this Magazine.

The Population of the Argentine Republic now amounts to 4,800,000, of whom more than one-fourth, or 1,250,000, are foreigners. Four-fifths of the foreigners are from the Latin countries—Italy, Spain, and France. Buenos Aires, with a population of 829,891, ranks as the first city in the southern hemisphere and is the second city of Latin races in the world. A recent estimate gives the following figures:

Italians	635,000
Spanish	250,000
French	115,000
Orientals	60,000
Brazilians	15,000
English	28,000
Chileans	26,000
Germans	22,000
Russians	20,000
Swedes	20,000
Others	59,000
Total foreigners	1,250,000
Total natives	3,550,000
Grand total	4,800,000

Draining of the Zuider Zee.—United States Consul Hill, at Amsterdam, reports that the project for draining the Zuider Zee has been withdrawn indefinitely from the States-General by the new ministry. The condition of the Dutch budget is so low that it could not furnish the funds for such an expensive

work. Furthermore, the price of land in the kingdom has fallen, making new agricultural holdings undesirable.

Hon. Seth Low has resigned the presidency of the American Geographical Society of New York city. Mr. Low was elected president to succeed the late Judge Daly.

It is announced in the *Geographical Journal* that a magnetic survey of India is to be made by the Indian Government. In addition to the observatories at Bombay and Calcutta, others are to be built at Dehia Dun, Kodaikanal, and Rangoon. The work is to be directed by the Survey and Meteorological Departments jointly.

Colonial Administration is the title of a special report by Hon. O. P. Austin, Chief of the Bureau of Statistics of the Treasury Department, now in press and soon ready for distribution. Mr. Austin passed the earlier months of 1901 in the capitals of Europe studying the colonial departments of the European governments, and this important volume is the result of his researches and observations.

Not one case of yellow fever occurred in Habana during the month of October, the month during which the fever is most prevalent in Cuba. In October, 1900, there were 308 cases, of which 74 died. This remarkable change is the result of an untiring war on the mosquito, waged by the sanitary officers of Habana. Major Gorgas, chief medical officer of Habana, reports that no attempt was made to disinfect clothing or to enforce quarantine against the neighboring towns where yellow fever was active. Their only aim was to kill the mosquitoes that had bitten a sick person, and to prevent any more mosquitoes from biting after the case was discovered. There is today an immune population of about 40,000 persons in Habana, which yellow fever has ravaged for 150 years.

A Map of the territory of the Amazon has been prepared and published by Ermanno Stradelli. It is based principally on his own extended explorations in west central Brazil, east of Peru and Bolivia. Mr. Stradelli's work in this region has been very important, as he has ascertained the course of several large southern tributaries to the Amazon, and shown that their career is quite different from that hitherto given on South American maps. Mr. Stradelli's map is on the scale of about 32 miles to the inch.

The reciprocity treaties and agreements between the United States and foreign countries since 1850 is the subject of a very timely report issued by Hon. O. P. Austin, Chief of the Bureau of Statistics of the Treasury Department. The text of these treaties is given in full, and also the text of such treaties as have been negotiated and are awaiting action. The agreements awaiting ratification by the United States Senate are conventions with Argentina, the French Republic, Bermuda, Jamaica, British Guiana, and Barbados. This valuable bulletin may be obtained by application to the Bureau of Statistics.

The effects of the drought of July, 1901, upon the trade, industry, and commerce of the United States are admirably described by Dr. R. DeC. Ward, of Harvard University, in an article in the Bulletin of the American Geographical Society. One striking instance of the effect of the drought may be cited. The withering of the pasturage in the southwest compelled the stockmen to ship thousands of cattle to the markets weeks before they had planned. At Kansas City alone, during the month of July, 1901, 263,000 more head of cattle were received than in July of the preceding year. As a result the market was so overstocked that the buyers dictated prices.

Naturalized Foreigners in the United States.—Nearly two-thirds of the foreign born males of voting age in the United States are naturalized or have filed their first naturalization papers. There are about five million foreign born men (5,006,483) who are 21 years or over in the United States proper. Of these, 2,848,324 are naturalized, 412,513 have taken out their first naturalization papers, 1,001,124 have made no application to become American citizens, and the condition of 744,522 is unknown—that is, of every 1,000 foreign born males of voting age 569 are American citizens, 82 have taken steps to become American citizens, 200 are still aliens, and the condition of 149 is unknown.

The British Government has made arrangements to send its mail for Australia and New Zealand via the United States instead of by the present route down the Suez Canal, the Red Sea, and across the Indian Ocean. This announcement is made by George H. Daniels, general passenger agent of the New York Central. A fast steamer will convey the mail to New York, where it will be placed on a Pacific Coast express and connect with the Oceanic Steamship Company vessels at San Francisco. On an average, six or seven days will be saved in the passage to Australia. Doubtless Europeans bound for Australia will soon follow the mail. The time gained is a small advantage to the traveler compared to the comfort of passing the entire trip in a cool climate instead of sweltering on a slow steamer on the Red Sea and Indian Ocean.

The completed report of the Isthmian Canal Commission differs but slightly from the preliminary report of the Commission, an abstract of which, with map, appeared in the January, 1901, number of this Magazine. The Commission, as before, favor the Nicaragua route, estimating that the canal by this route would cost $63,500,000 less than the sum for which the Panama property can be purchased and the canal completed. The final surveys have shortened the proposed Nicaragua route three miles, and have enabled the Commission to plan for eight locks instead of nine. The entire distance is now 183.66 miles, of which 73.78 miles are of the canal proper, and the remainder lake and river. The total cost is estimated at $189,000,000, which is $11,000,000 less than the amount previously reported. This large sum saved is because the engineers have discovered a better site for the gigantic dam that must be built to regulate the level of Lake Nicaragua.

Territorial Expansion of the United States.—The additions made to the thirteen original colonies and the transformation of this territory into separate territories and states is admirably described in a recent useful report by Hon. O. P. Austin. Mr. Austin has shown the different changes in state and territorial boundaries by a series of diagrams. For instance, diagram No. 7, 1803, presents the Louisiana Purchase as one province ; No. 8, 1804, shows the province divided into the Louisiana District and the Territory of Orleans; No. 10, 1810, shows the Orleans Territory admitted as the State of Louisiana, and the Louisiana Territory changed in name to the Territory of Missouri. The successive breaking up of the Territory of Missouri into the Territory of Arkansas and the State of Missouri, and all following changes are graphically shown. The diagrams form a series of moving pictures of the rapid changes in the boundaries of our fifty odd states, territories, and possessions.

The Military Information Division of the War Department will publish within a few weeks a comprehensive report on the colonial armies of the great powers.

GEOGRAPHIC LITERATURE

*__Alaska:__ Volume I, Narrative, Glaciers, Natives. By John Burroughs, John Muir, and George Bird Grinnell. Volume II, History, Geography, Resources. By William H. Dall, Charles Keeler, Henry Gannett, William H. Brewer, C. Hart Merriam, George Bird Grinnell, and M. L. Washburn. New York: Doubleday, Page & Company. 1901. [Superimprinted] Harriman Alaska Expedition, with the coöperation of the Washington Academy of Sciences. [Edited by Dr. C. Hart Merriam.] With 39 colored plates, 85 photogravure plates, 5 maps, and 240 text figures. Pp. xxxvii, 383. $15.00

One of the handsomest pieces of bookmaking ever produced has recently appeared in the form of a report on the Harriman Alaska Expedition. The two sumptuous volumes are models in such matters as typography, paper, binding, and the like; they are unique, at least so far as solid scientific literature is concerned, in certain matters of execution, such as the neat loose covers matching the permanent binding; the numerous color-plates touch a new apex in the triangular ideals of fidelity to nature, strength of expression, and refinement in line and tone; the photogravures are unexcelled examples of that mode of picturing which was last century's richest gift to art, while the text cuts are at once germane, graphic, and artistic. The first impression produced by the book is that it is a thing of beauty.

The body of the work begins with John Burroughs' narrative of the expedition. It is a novel chapter in the history of expeditionary enterprise. The family would go a-touring; the head thereof would have the tour instructive; so the family was temporarily enlarged to a ship-load of congenial folk, including a "scientific party" of 25 eminent savants who were to breathe out the instruction. Then, to tempt the grave and reverend seigniors, as well as to give zest to the lessons, provision was made for research along new lines—for actually augmenting the sum of human knowledge—and a corps of artists, photographers, stenographers, and doctors was added, together with officers and crew of the good ship *George W. Elder*. The full outfit aggregated 126 persons, with such facilities and supplies that when all was done (with the milch cow left over) and the party debarked, the faithful poet-scribe jotted the feeling that all "had traveled far and fared well" ere he dropped his pen. Yet, before reaching this mild benediction, he drew one of the most telling word pictures of geographic journeying ever done in this land of magnificent distances. The enthusiastic glacialist, John Muir, follows Burroughs with a memoir on "Pacific Coast Glaciers," and the versatile editor of *Forest and Stream*, Dr. George Bird Grinnell, describes the "Natives of the Alaska Coast Region." Both of these contributions represent the results of previous researches, as well as those of observations made during the expedition; and the legion of new-found and newly christened glaciers receive special attention. The second volume opens with a succinct account of discovery and exploration in the territory by the veteran Alaskan, Dr. W. H. Dall; Dr. Charles Keeler describes the birds, and Prof. Bernard E. Fernow discusses the forests; Henry Gannett follows with a summary of Alaskan geography, already printed in this Magazine, while Prof. William H. Brewer discusses the peculiar atmos-

* "The General Geography of Alaska," by Henry Gannett, one chapter in this remarkable work, was published in full in the May, 1901, number of this Magazine.

pheric effects of Alaska; Dr. Merriam describes "Bogoslof, our newest Volcano," and Dr. Grinnell and M. L. Washburn, respectively, summarize the salmon industry and the fox farming of our remote commonwealth—and more strictly literary features attest the inspiration of a trip in which the prosaic and the poetic were so happily blent. Naturally, in view of the eminent authorship, the several chapters are notably authentic and trustworthy; and the whole must long serve as the standard source of general information concerning the vast territory just entering on a promising career of industrial, commercial, and social development. Nor are these two volumes all; for additional chapters, prepared through the coöperation of the Washington Academy of Sciences, are to follow so soon as the material is elaborated

The work is a notable one in plan and scope, and in the combination of utility and beauty displayed by the volumes—indeed, such are its excellencies that the chief imperfections readily detected are merely (1) insufficient recognition of the editorial labors, and (2) the absence of a trenchant title—for, despite an acceptable title-page caption the full titles are unlike, and the name on the back is that of the expedition and not that of the book.

W J M.

'Twixt Sudan and Menelik. By Capt. M. S. Wellby, with many illustrations and two maps. New York: Harper & Bros. 1901.

There is an art of travel in wild countries; an art made up of all sorts of applied knowledge—physiology, medicine, engineering, cooking, shooting, and human sympathy. Of this art Captain Wellby was a master, and a greater master, I think, than would be suggested by his book, save to those who have had some experience similar to his own. There is no systematic attempt to teach his art, nor is there indeed any systematic presentation of the results of a very notable journey through unknown regions. The author explains that preparation for service in South Africa followed fast upon his return from the Sudan. There was thus but little time for the sifting and arrangement of the very large mass of material which must have been obtained by a traveler of such experience and intelligence.

Yet all who are interested in African exploration must rejoice that fate permitted the making of this straightforward story before carrying its author to an heroic death on the veldt. In the book one finds something of that oversupply of detail which mars nine-tenths of all the books of travel. Yet happily Captain Wellby had an instinctive elective faculty which gives to the greater part of even the trivial recitals a value either for the stay-at-home or for other wanderers. Indeed, for the traveler, some hints may be taken from almost every page. And the chief lesson is perhaps this: that kindness of heart and sweet charity are not thrown away when shown toward black Africans. Nay, not more than if shown to your own friends. A less sympathetic man, a man less truly brave than Captain Wellby, might have recounted more of startling adventure and less of instruction.

The most valuable portion of the book is, of course, that dealing with the journey from Addis Abeba to the White Nile, since the route from Zeila to Addis Abeba is already well known. Captain Wellby's narrative has much importance as bearing upon the country and peoples met as one travels southwestwardly from Menelik's capital. Intertribal feuds and Abyssinian raids may seriously change the locus, the numbers, even the views, of several small tribes whose present habitat had never, before Captain Wellby's appearance, known the white man's presence. This first record is therefore of spe-

cial importance to the student of primitive man. A suggestion of the varied experiences met with in the journey through the Lake Rudolf (or Gallop) region and the country lying to the west of the lake is had in reading the list of the names of tribes, many of them unknown, none of them well known. Thus, Arusi Galla, Walamo, Alibori, Wangobeino, Gallopa, Lokub, Turkana, Loka, Abbas, Tamata, Boma, Morelli, Shillaks, and Dinkas. Of these the Walamo are noteworthy for their alleged and widely credited power of bewitching with devils. The Turkana are remarkable for their great size. Captain Wellby puts a higher estimate than most travelers upon the capacity of the Abyssinian character in respect to the higher emotions—friendship, charity, generosity—the very qualities which would be most readily developed by his own lovable nature. One is permitted to doubt the author's prediction that most of their present defects will be largely cured by intercourse with Europeans. In using well-established native names of lakes and rivers, rather than those proper names of European travelers assigned for glory's sake, Captain Wellby administers a reproof to vanity. The general reader of this important book will inevitably feel a sympathetic interest in its author. The graceful introduction and epilogue, written respectively by his friends Colonel Harrington and Sir Rennel Rodd, will pleasantly gratify this interest. Many good photographs and two maps add to the value of the text.

OSCAR T. CROSBY.

Animals of the Past. By F. A. Lucas. With many illustrations. New York: McClure, Phillips & Co. $2.00.

Mr. Lucas has given the public a book that has long been needed, an authoritative but simply written account of the strange animals of past ages. In a chapter on the "Rulers of the ancient seas," the author sketches the successive races of creatures who ruled the oceans long before the advent of man. "For a time the armor-clad fishes held undisputed sway; then their reign was ended by the coming of the sharks, who in their turn gave way to the fish-lizards, the Ichthyosaurs and Plesiosaurs." Then came great marine reptiles, who extended their empire from New Zealand to North America, the Mosasaurs. These maintained their headquarters in the oceans that rolled over western Kansas. As this great plain in the course of hundreds of centuries was gradually lifted, they were imprisoned, the weaker captured by the stronger, and in time even the latter were strangled by the freshening of the water or starved by the disappearance of their food supply. Then sharks came into power again, small sharks with little teeth and great sharks with gaping jaws six feet across and inside hundreds of gleaming teeth, three, four, and five inches long. These enormous sharks swarmed everywhere that the water was warm, and then they disappeared utterly. Chapter headings of the volume are as follows: "Fossils and how they are formed," "The earliest known vertebrates," "Impressions of the past," "Rulers of the ancient seas," "Birds of old," "The Dinosaurs," "Reading the riddles of the rocks," "Feathered giants," "The ancestry of the horse," "The mammoth," "The mastodon," "Why do animals become extinct?"

Our National Parks. By John Muir. With illustrations. New York: Houghton, Mifflin & Co. $1.75.

The magnificence of scenery of the western United States and what is being done to preserve it by reservations like the Yosemite and Yellowstone National Parks is the theme of this volume. Mr. Muir says his aim in writing the series of sketches has been to incite people "to come and enjoy them [the national parks] and get them into their hearts,

that so at length their preservation and right use might be made sure." The following paragraph, quoted from Mr. Muir, describes the rapid change that has taken place by the hand of man:

"Only thirty years ago, the great Central Valley of California, five hundred miles long and fifty miles wide, was one bed of golden and purple flowers. Now it is ploughed and pastured out of existence, gone forever,—scarce a memory of it left in fence corners and along the bluffs of the streams. The gardens of the Sierra, also, and the noble forests in both the reserved and unreserved portions are sadly hacked and trampled, notwithstanding the ruggedness of the topography,—all excepting those of the parks guarded by a few soldiers. In the noblest forests of the world, the ground, once divinely beautiful, is desolate and repulsive, like a face ravaged by disease. This is true also of many other Pacific Coast and Rocky Mountain valleys and forests. The same fate, sooner or later, is awaiting them all, unless awakening public opinion comes forward to stop it. Even the great deserts in Arizona, Nevada, Utah, and New Mexico, which offer so little to attract settlers, and which a few years ago pioneers were afraid of, as places of desolation and death, are now taken as pastures at the rate of one or two square miles per cow, and of course their plant treasures are passing away,—the delicate abronias, phloxes, gilias, etc. Only a few of the bitter, thorny, unbitable shrubs are left, and the sturdy cactuses that defend themselves with bayonets and spears."

Commercial Geography. By Cyrus C. Adams. With illustrations and maps. New York: D. Appleton & Co.

In breadth of treatment and systematic plan this book is equaled by no commercial geography yet published. Mr. Adams is an eminent expert on the editorial staff of the New York *Sun* and has spent many years studying the problems of commercial geography. He has successfully aimed in the present volume to keep constantly before the reader the geographic influences affecting commerce. Very few statistics are given, their place being taken by diagrams and charts. Instead of grouping the different products under the traditional heads of animal, vegetable, and mineral commodities, Mr. Adams has treated each product in connection with that country in whose commerce it is most prominent. For instance, cotton is discussed under the United States, which produces three-fourths of the raw cotton of the world.

The book is written in a simple and entertaining style that commends it to every one. The volume is especially fortunate at the present time, when the people of the United States are thinking about and studying the problems of commerce as perhaps they have never done before. One who wishes to refresh his mind as to what the different nations have to offer each other could not do better than read Mr. Adams' "Commercial Geography." The one criticism that might be offered of this scholarly work is that the value of the book suffers because it contains no references of places where the general reader may look for further information. A brief bibliography would add immensely to the convenience of the book.

Seen in Germany. By Ray Stannard Baker. With illustrations. New York: McClure, Phillips & Co. $2.

This is an interesting sketch of German life among all classes. A chapter gives an account of the German workingman—of his daily life, his wife, his food, his problems, and his relations with his government. The German workingman is supposed to work 11 hours a day and often longer, and for his long day receives from one-third to one-half the wages of an American, work-

ing only eight hours of the twenty-four. Mr. Baker states that wages have risen nearly 33 per cent in the last fifteen years, but this gain has been outbalanced by doubling in cost of food. He makes the startling statement that the staples of food actually cost the German more than they do the American; so that he never thinks of buying butter, milk, eggs, or white flour, which the American would consider absolute necessaries. The government keeps a fatherly eye over the workingman, sees that his bread is rightly made, and that he makes provision for his old age. The result of this paternal care, in Mr. Baker's judgment, is greater efficiency in work, but not in the mental development of the workman.

The New Basis of Geography. By Jacques W. Redway. New York: The Macmillan Co.

This volume, written by a well-known writer and lecturer on geographic subjects, is designed to give teachers a broad interpretation of geography, more particularly of the "relations between human activities and geographic environment." It emphasizes the fact that "man and nature, man in nature, not man alone, or nature alone, are the true subjects of interest and of study in geography." It is a very suggestive and stimulating book, and is unhesitatingly recommended to all students of geography.

Armenia—Travels and Studies. By H. F. B. Lynch. Two vols. With many colored illustrations and maps. Longmans, Green & Co. $15.

Mr. Lynch describes two journeys in Armenia, the first extending from August, 1893, to March, 1894, and the second from May to September, 1898. The first volume deals with the Russian provinces, the second with the Turkish. Mr. Lynch describes the commercial prosperity and the obedience to law which has been the result of the Russian rule. Erivan is an instance of a small and sleepy town springing into a prosperous commercial center under Russian occupation. Unfortunately, however, says Mr. Lynch, the Russian Government has not confined its energies to maintaining public order, but has sought to regulate the Armenian schools, and has thus almost stifled education. "The result is the Armenian must sink his individuality and resign his initiative into Russian hands." In the Turkish provinces conditions are very bad; the Armenian is badgered and tortured by the Kurd, and neither his life, house, or shop is safe.

The volumes present an immense amount of information—geographical, political, and historical The numerous maps and illustrations are beautifully engraved. An exhaustive bibliography and comprehensive index complete this valuable work.

The Insect Book. By Dr. L. O. Howard. With many illustrations. New York: Doubleday, Page & Co. $3.

The Insect Book will be prized by the amateur who in spare moments takes delight in making collections and in studying insect life. Dr. Howard has aimed "to encourage the study of life histories of insects," and, wherever possible, gives a typical life history of each family. He tells not only what is known, but also what is not known, but which can be more or less easily found out. The book is handsomely illustrated from photographs of insects.

Europe and the Other Continents. By R. S. Tarr and F. N. McMurry. New York: The Macmillan Co. $0.75.

Professors Tarr and McMurry are experienced and successful teachers of geography, and are thus able to write a geographic text-book containing the most important facts that a pupil should learn. A special feature of the volume

are 435 colored maps, diagrams, and charts that present in graphic and terse form much information for which there would otherwise be no space. This is the third volume in the series of Tarr and McMurry's Geographies.

The Great Deserts and Forests of North America. By Paul Fountain. Longmans, Green & Co. $3.75.

The volume consists of a series of rambling but entertaining notes of the author's travels in the western United States, for the most part made some thirty years ago. The title is misleading, for the book is in no sense descriptive of what its name implies.

Australia—The Commonwealth and New Zealand. By Arthur W. José. New York: The Macmillan Co. $0.40.

The author lived for seventeen years in the four colonies of eastern Australia, and speaks with an intimate knowledge of his subject. In this little volume of 150 pages he gives a summary of the exploration, development, and experiments at self-government in the island continent and in New Zealand.

In the Ice World of the Himalaya. By Fanny Bullock Workman and William Hunter Workman. With maps and illustrations. New York: Cassell & Co. $4.00.

"In the Ice World of the Himalaya" is the modestly told story of record climbing among the great peaks of the Himalaya. Mrs. Workman is the champion woman mountain-climber of the world, but speaks as modestly of reaching the summit of Koser Gunge, 21,000 feet, or Mount Bullock Workman, 19,450 feet, as though she were walking down Fifth Avenue. As the authors very truly remark, mountain-climbing in the Himalaya is quite different from mountaineering in Switzerland and the Tyrol. Instead of hotels and villages within a few hours distance, and shelter-huts and a corps of guides, the mountaineer in the Himalaya must march many days beyond even the last semi-civilized village, and then fight his way up the mountain handicapped by coolies whom he must coax and bully along. A number of excellent pictures from photographs give a graphic idea of the great peaks.

The Highlands of Asiatic Turkey. By Earl Percy, M. P. New York: Longmans, Green & Co. $3.75.

Earl Percy gives the record of a journey in 1899 through Asia Minor from Constantinople to Busra, on the Persian Gulf. Two detail maps of the country are published. There is much information in the volume, but presented in a somewhat heavy manner. There is the usual plaintive chapter appealing to the British Government to wake up and take a definite policy in western Asia.

The Bureau of Forestry has published "Notes on the Red Cedar," by Charles Mohr (Bul. No. 31), and "Practical Forestry in the Southern Appalachians," by Overton W. Price. The former contains a map showing the present distribution of red cedar in the United States. The densest growth of cedar is in Tennessee, west Florida, and central Alabama, while west of the 101st meridian there is none at all. Mr. Price explains the growing need of systematic forest management in the southern Appalachians, and makes a number of practical suggestions.

The great industrial depression in Germany, which has rendered idle more than one-fourth of her workingmen, is the subject of a special report by the U. S. consul general at Berlin, Frank H. Mason (Consular Reports, November 9, 1901, No. 1185).

The Chinese protocol, signed September 7, 1901, is published in full in the Consular Reports for November 5 (No. 1180).

NATIONAL GEOGRAPHIC SOCIETY

PROCEEDINGS

MEETINGS OF THE SOCIETY:

November 1, 1901.—Vice-President McGee in the chair.

A paper by Dr. Angelo Heilprin, of Philadelphia, advocating the establishment of a "National Geographic Institute" at Washington, was read by the Secretary. The paper was referred for consideration to a committee consisting of Wm. H. Dall, A. J. Henry, and R. U. Goode. Further notice of the paper will be made later.

Gilbert H. Grosvenor, A. M., gave a brief address on the "Geographic Societies of Europe and America," more particularly of those on the former continent. The Vice-President in an eloquent address explained why the study of geography appeals to the intellect and heart of men.

November 15.—Vice-President McGee in the chair.

Dr. Marcus Baker read a paper on "The Lost Boundary of Texas," an abstract of which appears on page 430 of this Magazine.

LECTURES:

November 8.—Vice-President McGee in the chair.

Dr. F. H. Wines, Assistant Director of the Census, opened the course of lectures presented by the Society this season by an address on "The Twelfth Census." Further notice of this lecture will be made later.

November 22.—Vice-President McGee in the chair.

Mr. Herbert L. Bridgman, Vice-President of the Arctic Club, gave an illustrated address on "Peary's Work and Progress during the Past Two Years." Mr. Bridgman exhibited a map prepared by Peary as a result of his work in 1900, showing in detail the northern coastline of the Greenland Archipelago. The worn character of the north coast, similar in character to the north coast of Grant Land, on the other side of Robeson Channel, showed unmistakably that the northern sea was a vast ocean, probably extending to the Pole itself. The map will not be published until Mr. Peary returns to the United States.

ANNOUNCEMENTS

POPULAR LECTURES:

December 6.—"The Interior of Borneo;" Prof. A. C. Haddon, Oxford, England.

The natives of Borneo were the object of study of an expedition dispatched to the island from England in 1898–1899. As leader of this expedition, Professor Haddon obtained much interesting information about the peoples and country of the little-known interior.

December 20.—"The Trans-Siberian Railway;" Hon. E. J. Hill.

As a member of important committees in the House of Representatives, Mr. Hill has taken a practical interest in the extension of American influence, and has just returned from the Orient over the Trans-Siberian Railway. His journey gave opportunities for observations of much interest, which will receive first announcement through the Society.

January 3, 1902.—"The New Mexico;" Hon. John W. Foster, ex-Secretary of State.

General Foster was United States minister to Mexico during the years 1873–1880, when the Republic was just starting on that phenomenal career of development which raised it to a prominent position among nations and placed its president among the world's great leaders. Twenty years later (in 1901) he revisited the country as its guest, and his observations and impressions will form the theme of his lecture.

January 17.—"American Progress and Prospects in the Philippines;" Gen. A. W Greely, Chief Signal Officer, U. S. Army.

General Greely has returned to America after an extended tour among the Philippine Islands. As an example of American progress in the Philippines, it may be stated that 6,000 miles of telegraph lines and cables have been put up in these islands by the U. S. Signal Corps in the three years since the capture of Manila. Telegraph and cable connections are now complete between the northern coast of Luzon and Jolo, 1,000 miles to the south.

MEETINGS OF THE SOCIETY:

December 13, 1901.—"The Northwest Boundary;" C. H. Sinclair, U. S. Coast and Geodetic Survey; E. C. Barnard, U. S. Geological Survey; Bailey Willis, U. S. Geological Survey.

December 27.—Holiday vacation.

January 10, 1902.—Annual meeting, reports and elections.

INDEX

Page

ABRUZZI, Arctic expeditions of Duke of 44, 203, 204, 247, 380
ABYDOS, Excavations at 396
ABYSSINIA—The country and people; Oscar T. Crosby 89
—, Geography of 274
—, Long-distance telephone in 96
—, Review of book on modern 274, 444
—, Slavery in western 98
ADAMS, C. C., Review of book by 445
AFRICA, Explorations in 148
—, central east, Explorations in 42
AFRICAN language in Jamaica 164
AGRICULTURAL exports of United States 380
ALASKA, Explorations in 206, 399
—, Forests of 193
—, General geography of; Henry Gannett 180
—, Narrative of Harriman expedition to 199, 442
—, Population of 193
—, Telegraph system of 6
ALEXANDER, E. P., cited on boundary between Nicaragua and Costa Rica 23
ALEXANDROWSK, Arctic harbor 83
AMERICA and China 269
—, List of maps of 409
—, Origin of the name of 326
AMERICAN Republics, Bureau of, Work of 247
— floating exposition; O. P. Austin 49, 204
— interests in Manchuria 270
— progress in the Philippines 405
AMUR, Finding of the mouth of 318
ANDORRA, Republic of 159
ANIMALS of the past 444
ANSCHÜTZ-KAMPFE, inventor of Arctic submarine boat 201
ANTARCTIC expedition, British 47, 203, 339
— —, German 47, 203, 311, 341 377
— —, Scottish 204
— —, Swedish 204, 406
ARC of Quito, Remeasurement of 316
ARCTIC currents, Testing of 404
ARCTICS, Work in, in 1901 ..... 82, 202, 280, 357, 380
ARGENTINE REPUBLIC, Population of 438
ASIA, Arid closed basin of 253
—, central, Explorations in 393, 405
—, cradle of humanity; W J McGee 281
—, Culture stages of 284
—, Distribution of cities of 251
—, Faunal divisions of 262
—, Floral bounding culture regions of 261
—, Human antiquity in 289
—, Races of 282
—, Rainfall and development of 256
—, southwestern, Link relations of; Talcott Williams 249, 291
—, World's debt to 290
ATHENS, Geological explorations near 401
ATLANTIC weather service 81
ATMOSPHERE surrounding the earth, Depth of 406
AUSTIN, O. P.; An around the world floating exposition 49, 204
—, Reference to work of 79, 204, 440, 441
AUSTRALIA, Explorations in 145
—, Glacial action in 161
—, Population of 241
—, Transcontinental railway of 313
AUSTRIA-HUNGARY, Population of 205

BAILEY, VERNON, Biological work by 247
BAKER, MARCUS, Gazetteer of Alaska by 409
—; Lost boundary of Texas 430
—; Kodiak, not Kadiak 397
—, Record of address by 448
— referred to 352
BAKER, R. S., Review of book by 445

Page

BALDWIN-ZIEGLER North Polar Expedition. 82, 202, 280
BALLOONS as an aid to exploration 347
BARNARD, E. C., Record of address by 128
—, Work on northwestern boundary by 162
BARRETT, JOHN; China: her history and development 209, 266
—, Record of address by 283
BATHYMETRICAL survey of freshwater lakes of England 408
BAUM, Indian village of 272
BEHAIM, MARTIN, Globe of 325
BELL, ALEXANDER GRAHAM, referred to 351
BELL, ROBERT, Director of Geological Survey of Canada 206
BICKERTON, A. W., Review of book by 166
BIGELOW, FRANK H., Record of address by 127
BIOLOGICAL SURVEY, Expeditions of 206, 247, 405
BOLIVIA, Chile's dispute with 401
—, Geographic work in 244, 406
BOUNDARY between Brazil and French Guiana, Location of 83
— — Nicaragua and Costa Rica, Location of 22
— of Texas 429
— surveys in the United States 106, 373, 409
—, Work on northwestern 161
BOXERS, Revival of the 57, 271
BRAZIL-FRENCH GUIANA boundary decision 83
BRIDGMAN, H. L., Letter from Peary to 358
—, Member of Peary relief party 280
—, Record of addresses by 166, 448
—, Telegram from 357
BRITISH Pacific cable 3, 78
— South Polar Expedition 47, 203, 339
— Yukon telegraph 164
BROOKS, A. H., Work in Alaska by 399
BROWN, H. C.; The Indian village of Baum 272

CABLE, British Pacific 3, 78
— equipment of a fleet 10
—, Survey for a Pacific 48
— system of Great Britain 3
CABLES, German submarine 163
—, New French ocean 315
—, Submarine, Influence upon military and naval supremacy of 1
—, West Indian 10
CALIFORNIA, Oil fields of 276
CANADA, Early explorations in 146
—, Population of 347
—, Unexplored 243
CANADIAN Rockies, Explorations in 439
CAPE to Cairo telegraph 162
CARNEGIE Museum, Field workers from 311
CAVES, Ice 433
CENTRAL AMERICA, Germany in 201
CENTURY Atlas of the World 126
CHALMERS, JAMES, Massacre of 316
CHANNEL Indians 20
CHART of the world 38
CHILE'S dispute with Peru and Bolivia 401
CHINA and America 269
— — Japan; some comparisons; Harrie Webster 69
—: Her history and development; John Barrett 209, 266
—, Military operations in 409
—, Powers in control of 78
—, Reforms in 434
—, Relations with the Romans of 216
—, Review of book by James Harrison Wilson on 207
—, Revival of the Boxers in 57
—, The coming and expulsion of Christianity in 215
—, Western progress in 434
CHINESE in the United States 388
—, Recuperative character of 211
CLARK, J. H., Survey of Texas boundary by 430
CLEVELAND, GROVER, referred to 23

Page

COAL, Output of, in the United States.... 348
COAST AND GEODETIC SURVEY, Work of.... 36, 158, 161, 207, 405
COLD-WAVE warnings.... 365
COLOMBIA, Revolutionary movements in.... 172
COLONIAL Administration, Report on.... 440
CONGER, Minister, referred to.... 59, 434
CONSULAR list of the United States.... 315
CONWAY, SIR MARTIN, Expedition sent by.... 406
COOK, FREDERIC A., Record of address by.... 166
COSTA RICA and Nicaragua, Boundaries between.. 22
COVILLE, F. V., Record of address by.... 127
COW-WORSHIPPERS among the Magois (Africa).... 43
CRANE, ALICE ROLLINS; The midnight sun in the Klondike.... 66
—; The northern lights.... 69
CROSBY, OSCAR T.; Abyssinia—The country and people.... 89
—, Book review by:.... 444
—, Record of address by.... 127
CUBA, Census of.... 80
—, Telegraph system in.... 5
—, Work by Geological Survey in.... 207

DAMASCUS and Mecca Railway.... 408
DARTON, N. H., Record of address by.... 127
DAVIDSON, GEORGE; Origin of the name "Cape Nome".... 398
DAVIS, ARTHUR P.; Location of the boundary between Nicaragua and Costa Rica.... 22
—, Record of address by.... 88
DAVIS, WM. M., Referred to.... 352, 409
DAWSON, GEORGE M., Obituary note on.... 197
—, Work in Yukon watershed by.... 146
DAY, DAVID T., Chart compiled by.... 407
—, cited on oil fields of Texas and California.... 276
DEATH rate in the United States.... 401
DE MORGAN, Excavations at Susa of.... 315
DENMARK, Population of.... 205
DESERT STORM.... 135
DIKES of Holland, The; Gerard H. Matthes.... 219
DRIFT of floating bottles in the Pacific Ocean; James Page.... 337
DRYGALSKI, ERICH VON, Leader of the German Antarctic Expedition.... 47, 204, 331, 378
DU CHAILLU, PAUL, Referred to.... 208, 315
DUMONT, SANTOS, Success in aerial navigation referred to.... 347

EGYPT, Recent discoveries in.... 396
EMORY, FREDERIC, Report on foreign commerce by.... 244
EMORY, W. H., cited on southern boundary of the United States.... 376
ERIVAN, Old post-road from Tiflis to.... 300
ETHNOLOGIC expedition to Santo Domingo.... 130
ETHNOLOGY, BUREAU OF AMERICAN, Work of.... 369
EVANS, JONES W., Leader of Conway's Bolivian expedition.... 406
EXCAVATIONS at Abydos.... 407
— at Susa.... 315
— near Athens.... 407
EXPOSITION, An American floating.... 49, 204
—, An Austro-Hungarian floating.... 164
EXPLORATIONS during nineteenth century.... 143
— in Alaska.... 399
— — central east Africa.... 42
— — Victoria's reign.... 160

FILIPINOS, Amusements of.... 121
—, Tools and weapons of.... 120
FIRE-WALK at Tahiti.... 425
FISH and Fisheries, U. S. Commission on, Work of.. 404
FLINDERS-PETRIE, Excavations by Prof.... 396
FLOOD warnings in United States.... 367
FORBES, R. H., referred to.... 104, 130, 145
FORD, ALEXANDER HUME, Record of address by.. 166
FORREST, JOHN, Australian railway scheme of.... 313
FOSTER, JOHN W., cited on Mexico.... 159
—; The Latin-American constitutions and revolutions.... 169

Page

FRANKENFIELD, H. C., Record of address by... 88, 127
FRANKLIN, JOHN, Arctic explorations of.... 144
FREMONT, JOHN C., Explorations of.... 146

GADSDEN Purchase.... 106, 377
GANNETT, HENRY; General geography of Alaska 180
—; George M. Dawson.... 197
—; Origin of Yosemite Valley.... 86
—, referred to.... 80, 199, 241, 314, 373, 388, 400, 409
GEIKIE, ARCHIBALD, Obituary note on.... 163
GENTHE, MARTHA KRUG; German geographers and German geography.... 324
GEOGRAPHIC facts from report of the Taft Philippine Commission.... 114
— literature.... 126, 165, 207, 248, 409, 442
— names, Decisions regarding.... 87, 125, 200, 242, 316
— notes.... 44, 77, 123, 158, 199, 240, 313, 347, 380, 399, 436
— progress in South America.... 244
GEOGRAPHIC SOCIETY, NATIONAL, Proceedings of. 88, 127, 166, 208, 447
— — —, Program of.... 411
GEOGRAPHICAL Congress, International.... 351
GEOGRAPHICAL Society, Imperial Russian.... 405
— — of Vienna.... 201
— —, Royal.... 101, 160
— Societies of France, Congress of.... 404
GEOGRAPHY, Certain persistent errors in.... 400
—, Elementary teaching in Germany of.... 333
GEOLOGICAL explorations near Athens.... 407
GEOLOGICAL SURVEY, Work of.... 206, 246, 314, 348, 399
GERDINE, T. G., in charge of Alaska expeditions.... 206, 399
GERMAN census, The.... 123
— geographers and German geography.... 324
— South Polar expeditions.... 47, 203, 311, 377
— submarine cable system.... 163
GERMANY in Central America.... 201
—, Suspension railway in.... 162
GILBERT, C. H., Reference to deep-sea work by.... 404
GILBERT, G. K., Record of address by.... 88
GLACIAL action in Australia.... 161
GLOTOF, STEPHEN, Discovery of Kodiak by.... 397
GREAT BRITAIN, Cable system of.... 3
— — in Yangtze valley.... 163
— —, Population of.... 240
GREECE, Survey of.... 206
GREELY, A. W.; Advances in geographical knowledge during the nineteenth century.... 143
—, Record of address by.... 88
— referred to.... 8, 247, 352
GROGAN, EWART S., Record of address by.... 88
GROSVENOR, EDWIN A., Record of address by.... 166
— referred to.... 283
—; Siberia.... 317
GROSVENOR, GILBERT H., Book reviews by.... 126, 165, 207, 248, 409, 444
—; Geographic notes.... 44, 77, 123, 158, 199, 240, 313, 347, 380, 399, 436
—; Next international congress to be held in Washington.... 351
—, Record of address by.... 448
—; Sex, nativity, and color of the people of the United States.... 381

HAARLEM Lake, Draining of.... 224
HAECKEL, ERNEST, referred to.... 286
HARRIMAN Expedition, Narrative volume of.. 199, 442
— — referred to.... 181
HARTI, HEINRICH, Survey of Greece by.... 206
HATCHER, J. B., Field-work of.... 311
—; The Indian tribes of southern Patagonia, Tierra del Fuego, and the adjoining islands.... 12
HAY, JOHN, referred to.... 269
HEDIN, SVEN, Explorations in Central Asia.... 45, 147, 393
HEILPRIN, ANGELO, Record of address by.... 448
HENRI OF ORLEANS, Obituary note on.... 346
HENRY, A. J., Record of address by.... 12
— referred to.... 81, 82, 248, 448
HILDER, F. F., Work in the Philippines of.... 119
—, Obituary note on.... 85
HIGH plains and their utilization.... 409

Page

HITCHCOCK, FRANK H., Report of..... 380
HODGE, F. W., Book review by 165
HOFFMAN, D. O. NOBLE; The Philippine exhibit at the Pan-American Exposition..... 119
HOLDER, CHARLES F.; A remarkable salt deposit.. 391
HOLLAND, The dikes of; Gerard H Matthes..... 219
—, Means of protection against flood discharges in.. 231
—, Recession of the coast line in..... 221
—, Reclaiming the land in..... 222
HOMOLOGRAPHIC projection, Invention of..... 38
HOVEY, ESTHER LANCRAFT; Old post-road from Tiflis to Erivan 300
HOVEY, E. O., Work of..... 346
HUBBARD, JAMES MASCARENE; Singan—The present capital of the Chinese Empire..... 63
—; The Tsangpo..... 32
HUBBARD Memorial Building..... 356
HUMAN antiquity in Asia..... 289
— progress, Course of..... 287
HUMBOLDT referred to..... 145
HYDROGRAPHIC OFFICE, Work of U. S..... 337

ICE caves..... 433
— in southern latitudes..... 439
INDIA, Census of..... 158
—, Native surveyors of..... 35
INDIAN tribes of southern Patagonia; J. B. Hatcher..... 12
— village of Baum..... 272
— —, Review of book by J. A. Udden on an old... 165
INDIANS, Papago, Customs of..... 103
, The Seri..... 278
ISTHMIAN CANAL COMMISSION, Report of..... 28, 441

JAMAICA, African language in..... 164
JAPAN AND CHINA—Some comparisons; Harrie Webster..... 69
JOHNSON, WILLARD D., referred to..... 278, 409
JUDD, S. D., Note of report on sparrows by..... 410

KENNAN, GEORGE, referred to..... 315
KIMBALL, H. H., Reference to paper on ice caves by 433
KODIAK, not Kadiak; Marcus Baker..... 397
KOLLM, GEORG; German South Polar Expedition.. 377
KONGO Basin, Exploration of..... 148
KOZLOFF, LIEUT., Note on expedition to central China by..... 405

LANGLEY, S. P., Notes from a diary of a trip to Tahiti..... 413
—, Report on Smithsonian Institution by..... 410
LATIN-AMERICAN constitutions and revolutions; John W. Foster..... 169
LE CONTE, JOSEPH, Obituary note on..... 309
LIGHTNING, Property loss by..... 82
LINK relations of southwestern Asia; Talcott Williams..... 249, 291
LITTLEHALES, G. W., Record of address by..... 88
— referred to..... 83
—; Survey for a cable to the Philippines..... 48
LIVINGSTONE'S explorations..... 149
LOMBROSO, CESARE, cited on China..... 206
LOW, SETH, referred to..... 357, 440
LUCAS, A. F., Discovery of oil in Texas by..... 277
LUCAS, F. A., Review of book by 444

MCADIE, ALEXANDER, Abstract of paper by..... 108
MCGEE, W J; Asia, the cradle of humanity 281
—, Book reviews by 207, 442
—; Col. F. F. Hilder..... 85
—; Ice caves and frozen wells..... 433
—; Joseph Le Conte..... 309
—, Muñiz collection exhibited by..... 242
—, Record of addresses by..... 166, 448
—; The old Yuma trail 103, 129
—; The Seri Indians..... 278
—; Work of the Bureau of American Ethnology... 369
MCKINLEY, Mount; Robert Muldrow 312

Page

MCKINLEY, President, In memoriam of..... 350
MANCHURIA, American interests in..... 270
MARQUESAS Islands..... 415
MARTIN, W. A. P., Record of address by 88
—; The siege of Pekin 53
MATTHES, GERARD H.; The dikes of Holland..... 219
MEAKIN, BUDGETT, Review of book by..... 208
MENDENHALL, W. C., Work in Alaska by..... 206, 399
MERRIAM, C. HART, Editor of Harriman Alaska publications..... 199
—, Reference to work of..... 206, 405
METEOROLOGICAL science, Development of 362
MEXICAN boundary survey..... 146
— cession, First..... 376
MEXICO, City of..... 178
—, Department of foreign affairs in..... 154
—, Factories of..... 176
—, John W. Foster on..... 159
—, Maps of..... 247
—, Mining in..... 157
— of today: Juan N. Navarro..... 152, 176, 235
—, Public education in..... 156
—, Roads in..... 177
MIDNIGHT sun in the Klondike; Alice Rollins Crane 66
MILLS, WM. C., Indian exhibit at Buffalo Exposition by 272
MINING and mineral resources of the United States. 407
MISSING link, Discovery of the..... 286
MOLLWEIDE, C. B., inventor of homolographic projection..... 38
MOORE, WILLIS L., referred to..... 81, 127, 362
—, Review of book by 126, 248
—; The Weather Bureau..... 362
MOORS, Review of book on land of the..... 208
MUIR, JOHN, Review of book by..... 444
MULDROW, ROBERT; Mount McKinley..... 312
MURAVIEFF, N. N., Explorations along the Amur by 318
MURRAY, JOHN, Oceanographic work of..... 150, 238

NAIN SINGH, Explorations of..... 34, 147
NANSEN referred to..... 144, 202, 342
NAVARRO, JUAN N.; Mexico of today 127, 152, 176
NEGRO element in the United States..... 385
NEUMANN, OSCAR, Note on African exploration by 407
NEWEST ENGLAND, Review of Demarest's book on 165
NICARAGUA and Costa Rica, Boundary between.... 22
NICARAGUA Canal, The..... 28, 441
NINETEENTH century, Geographic progress during..... 143
NORDENSKJOLD, ADOLF ERIK, Death of..... 348
NORDENSKJOLD, OTTO, Leader of Swedish South Polar Expedition 144, 204, 406
NOME, Cape, Origin of name of..... 398
NORTHERN lights, The; Alice Rollins Crane..... 69
NORTH Polar Expedition, The first known..... 324
NORTHWEST boundary of the United States..... 161

OIL fields in Texas and California..... 276
OLD Yuma trail, The; W J McGee..... 103, 129
OREGON Territory, Boundaries of..... 374
ORLEANS, HENRI OF, Death of..... 346

PACIFIC cable, A..... 6
— Coast, Natives of..... 20
— Railway Route survey..... 146
PAGE, JAMES; Drift of floating bottles in the Pacific Ocean 337
— referred to..... 438
PAPAGO Indians, Customs of..... 103
PARK, MUNGO, Explorations of..... 148
PARKER, E. W., Report on coal output by..... 348
PATAGONIA, southern, Indian tribes of..... 12
PEARY, JOSEPHINE D., referred to..... 202, 361
PEARY, ROBERT, Arctic work of..... 144, 202, 357, 448
PEKIN, Causes leading to the siege of..... 53
PERU, Chile's dispute with..... 401
PETERS, W. J., Alaska expeditions by..... 206, 399
—, Record of address by..... 88

Page

PHILIPPINE exhibit at the Pan-American Exposition ... 119
PHILIPPINE Islands, American progress in ... 405
— —, Forests of ... 47
— —, Harbors and highways of ... 116
— —, Map of ... 406
— —, Ownership of land in ... 115
— —, Telegraphs in ... 6, 405
— —, Weather service of ... 248
PHILLIPS, P. L., List of American maps by ... 409
PIKE, GENERAL, Explorations by ... 146
PINCHOT, GIFFORD, Record of address by ... 88
PLATEAU barometry of the United States ... 127
PORTO RICO, Census of ... 80
—, Charting the coast of ... 45
—, Telegraph system in ... 5
POWELL, J. W., cited on African language in Jamaica ... 164
—, Researches among Indians by ... 284
PULLAR, LAURENCE, Survey of English lakes by ... 408
PUTNAM, G. R., Charting harbors of Philippines by ... 125

QUERINI, FRANCO, Search for ... 44, 380
QUITO, Remeasurement of the arc of ... 316

RACES of Asia ... 283
RAILWAY, Australian ... 313
—, Suspension, in Germany ... 162
—, Trans-Siberian ... 44, 206, 322
RECIPROCITY Treaties, Report on ... 440
REDWAY, J. W., Review of book by ... 446
RICHTHOFEN, VON, referred to ... 330, 351
RIVER profiles ... 314
ROYAL GEOGRAPHICAL SOCIETY ... 160, 247, 339
RUSSIAN Monroe doctrine ... 323

SALT deposit, A remarkable ... 391
SAN MORINO, Republic of ... 199
SAVILLE, M. H., Record of address by ... 88
SCHOTT, C. A ; Recent contributions to our knowledge of the earth's shape and size ... 36
—, Record of address by ... 88
SCIDMORE, ELIZA R., referred to ... 352, 403
SEA fogs of San Francisco ; Alexander G. McAdie ... 108
SERI INDIANS, The ; W J McGee ... 278
SERVIA ... 241
SIBERIA, The resources and future of ; Edwin A. Grosvenor ... 317
—, Development of ... 78
— Railway ... 44, 206, 322, 438
SIGNAL CORPS, U. S., Work of ... 5, 405, 406
SINCLAIR, C. H., Work on northern boundary by ... 162
SINGAN, A Chinese capital ... 63
SMITH, DONALDSON, Expedition of, in central east Africa ... 42, 247
SMITHSONIAN INSTITUTION, Report of, for 1900 ... 286
SONOYTA—The Sump of ... 133
SNOWFALL, Effect on water supply of ... 124
SOUTH AFRICA, Military operations in ... 409
SPENCER, A. C., Record of address by ... 127
SPITZBERGEN, Russian expedition to ... 404
SQUIER, GEORGE O. ; Influence of submarine cables upon military and naval supremacy ... 1
STANLEY-BROWN, JOSEPH, Record of address by ... 88
STATISTICS, BUREAU OF, Treasury Department, Reports by ... 402, 409
STEIN, ROBERT, Polar expedition of ... 380
STEPHENS, H. MORSE, Record of address by ... 166
SUBMARINE Arctic boat ... 201
— cable systems ... 8, 163, 315
SUEZ Canal, Traffic on ... 380
SVEN HEDIN'S explorations in central Asia ... 45, 393
SVERDRUP, No news from Captain ... 380
SWITZERLAND, Population of ... 205

TAFT Philippine Commission, Report of ... 114
TAHITI ; by S. P. Langley ... 413
TEALL, J. J., Director of British Geological Survey ... 163
TEHUELCHES, So-called race of giants ... 12

Page

TELEGRAPH, British Yukon ... 164
—, Cape to Cairo ...
—, Philippine military ... 6
— system in Cuba and Porto Rico ... 5
—, The Alaskan ... 6
TERRITORIAL acquisitions, Boundaries of ... 373
TEXAS, Lost Boundary of ... 430
—, Northwestern boundary of ... 376
—, Oil fields of ... 276
TIBET, Explorations of ... 33, 147, 403
TIERRA DEL FUEGO, Indian tribes of ... 12
TIFLIS and Erivan, Old post-road between ... 300
TITTMANN, O. H., referred to ... 37, 161, 373
TODD, W. E. C., Field-work of ... 311
TOLL, BARON, Arctic work of ... 404
TOWNSEND, CHARLES H., Compiler of Fish Commission records ... 410
TSANGPO, The ; James Mascarene Hubbard ... 32

UDDEN, J. A.; Review of book by ... 165
UNITED KINGDOM, Population of ... 240
UNITED STATES, Agricultural exports of ... 380
— —, Boundaries of ... 161, 373, 441
— —, Center of population in ... 241
— —, Chinese, Japanese, and Indians in ... 388
— —, Coal output of ... 348
— —, Colonial telegraph system for ... 5
— —, Commercial relations of ... 244, 402
— — Consular list ... 315
— —, Death rate in, in 1900 ... 401
— —, Foreign born in ... 385, 441
— —, Immigration to ... 383, 403
— — Institutions which promote geographic research ... 355
— —, Literacy of men of ... 437
— —, Mapping of ... 123
— —, Males and females in ... 388
— —, Mineral products of ... 407
— —, Sex, nativity, and color of people of ... 381
— —, Urban population of ... 345

VENEZUELA, Revolution in ... 171
VICTORIA, Exploration during reign of ... 160
VIENNA, Recent census of ... 164
VLADIVOSTOK, terminus of the Siberian Railway ... 319

WAINWRIGHT, D. B., Record of address by ... 88
WALLACE, Scientific work in the Amazon Basin of ... 145
WALKER, J. G., referred to in connection with Nicaragua Canal ... 26
WARD, R. De C., Referred to ... 409, 440
WATER supply, Effect of snowfall on ... 124
WEATHER BUREAU, The ; Willis L. Moore ... 362
— —, Work of ... 81, 108, 124, 127, 164, 248
WELLBY, CAPTAIN, Review of Abyssinian book by ... 443
WELLMAN, WALTER, Plans for Arctic work of ... 202, 233
WHITE, ANDREW D., Referred to as delegate to Geographic Congress ... 352
WILCOX, W. D. ; Work in Canadian Rockies ... 439
WILCOX, WALTER F., Summary of conference on United States boundaries by ... 373
WILDE, AUGUSTUS B., Review of book by, on modern Abyssinia ... 274
WILLIAMS, TALCOTT ; The link relations of southwestern Asia ... 249, 291
—, Record of address by ... 166
—, referred to ... 282, 203
WILLETTS, GILSON, Record of address by ... 166
WILLIS, BAILEY, Work on northwest boundary ... 162
WILSON, H. M., Referred to ... 123
WINES, H. F., Record of address by ... 448
WORLD routes ... 321
WYOMING, Oil fields of ... 278

YANGTZE Valley, Great Britain in ... 163
YELLOW Fever, Conquest of, in Habana ... 440
YOSEMITE Valley, Origin of ... 86

ZUIDER ZEE, Draining the ... 314, 439
—, Formation of the ... 221

THE

NATIONAL GEOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY

EDITOR-IN-CHIEF: HENRY GANNETT
MANAGING EDITOR: GILBERT H. GROSVENOR

ASSOCIATE EDITORS

A. W. GREELY
W J McGEE
C. HART MERRIAM
DAVID J. HILL
ELIZA RUHAMAH SCIDMORE
MARCUS BAKER
WILLIS L. MOORE
O. H. TITTMANN
O. P. AUSTIN
IDA M. TARBELL
CARL LOUISE GARRISON

VOL. XII—YEAR 1901

McCLURE, PHILLIPS & CO.
NEW YORK

WASHINGTON, D. C.
JUDD & DETWEILER, PRINTERS
1901

CONTENTS

	Page
The Influence of Submarine Cables upon Military and Naval Supremacy ; by GEORGE O. SQUIER	1
The Indian Tribes of Southern Patagonia, Tierra del Fuego, and the Adjoining Islands ; by J. B. HATCHER	12
Location of the Boundary between Nicaragua and Costa Rica ; by ARTHUR P. DAVIS	22
The Nicaragua Canal	28
The Tsangpo ; by JAMES MASCARENE HUBBARD	32
Recent Contributions to our Knowledge of the Earth's Shape and Size by the United States Coast and Geodetic Survey ; by C. A. SCHOTT	36
Explorations in Central East Africa	42
Geographic Notes	44
The Principles Underlying the Survey of the Bottom of the Ocean for an All-American Trans-Pacific Cable to the Philippines and the Orient ; by E. W. LITTLEHALES	48
An Around-the-World American Exposition ; by O. P. AUSTIN	49
The Causes that Led up to the Siege of Pekin ; by W. A. P. MARTIN	53
Singan—the Present Capital of the Chinese Empire ; by JAMES MASCARENE HUBBARD	63
The Midnight Sun in the Klondike ; by ALICE ROLLINS CRANE	66
The Northern Lights ; by ALICE ROLLINS CRANE	69
Japan and China—Some Comparisons ; by HARRIE WEBSTER	69
Geographic Notes	77
Death of Colonel Hilder ; [W J McGEE]	85
The Origin of Yosemite Valley ; by HENRY GANNETT	86
Geographic Names	87
Proceedings of the National Geographic Society	88
Abyssinia—The Country and People ; by OSCAR T. CROSBY	89
The Old Yuma Trail ; by W J McGEE	103
The Sea Fogs of San Francisco	108
Geographic Facts from Report of the Taft Philippine Commission	114
The Philippine Exhibit at the Pan-American Exposition ; by D. O. NOBLE HOFFMAN	119
Geographic Notes	123
Geographic Literature	126
Proceedings of the National Geographic Society	127
The Old Yuma Trail (continued) ; by W J McGEE	129
Advances in Geographic Knowledge during the Nineteenth Century ; by A. W. GREELY	143
Mexico of Today ; by DON JUAN N. NAVARRO	152
Geographic Notes	158
Geographic Literature	165
Proceedings of the National Geographic Society	166
The Latin-American Constitutions and Revolutions ; by JOHN W. FOSTER	169
Mexico of Today (continued) ; by DON JUAN N. NAVARRO	176
The General Geography of Alaska ; by HENRY GANNETT	180
George M. Dawson ; [HENRY GANNETT]	197
Geographic Notes	199
Geographic Literature	207
Proceedings of the National Geographic Society	208

	Page
China : Her History and Development ; by JOHN BARRETT	209
The Dikes of Holland ; by GERARD H. MATTHES	219
Mexico of Today (concluded) ; by DON JUAN N. NAVARRO	235
Sir John Murray	238
Geographic Notes	240
Geographic Literature	248
The Link Relations of Southwestern Asia ; by TALCOTT WILLIAMS	249
China : Her History and Development (concluded) ; by JOHN BARRETT	266
The Indian Village of Baum ; by H. C. BROWN	272
The Geography of Abyssinia ; by AUGUSTUS B. WILDE	274
Oil Fields of Texas and California	276
The Seri Indians	278
Asia, the Cradle of Humanity ; by W J McGEE	281
The Link Relations of Southwestern Asia (concluded) ; by TALCOTT WILLIAMS	291
The Old Post-road from Tiflis to Erivan ; by ESTHER LANCRAFT HOVEY	300
Joseph Le Conte ; by W J McGEE	309
Mount McKinley ; by ROBERT MULDROW	312
Geographic Notes	313
Siberia ; by Prof. EDWIN A. GROSVENOR	317
German Geographers and German Geography ; by MARTHA KRUG GENTHE	324
The Drift of Floating Bottles in the Pacific Ocean ; by JAMES PAGE	337
The British Antarctic Expedition	339
Urban Population of the United States	345
Geographic Notes	347
Next International Geographical Congress to be Held in Washington ; [GILBERT H. GROSVENOR]	351
Peary's Work in 1900 and 1901	357
The Weather Bureau ; by WILLIS L. MOORE	362
Work of the Bureau of American Ethnology ; by W J McGEE	369
Boundaries of Territorial Acquisitions	373
The German South Polar Expedition ; by GEORG KOLLM	377
National Geographic Society Calendar, 1901–1902	379
Geographic Notes	380
The Sex, Nativity, and Color of the People of the United States; [GILBERT H. GROSVENOR].	381
A Remarkable Salt Deposit ; by CHARLES F. HOLDER	391
Sven Hedin's Explorations in Central Asia	393
Recent Discoveries in Egypt	396
Kodiak not Kadiak ; [MARCUS BAKER]	397
Origin of the Name "Cape Nome ;" by GEORGE DAVIDSON	398
Geographic Notes	399
Geographic Literature	409
National Geographic Society Program of Lectures and Meetings	411
Diary of a Voyage from San Francisco to Tahiti and Return, 1901 ; by S. P. LANGLEY	413
The Lost Boundary of Texas ; by MARCUS BAKER	430
Ice Caves and Frozen Wells ; by W J McGEE	433
Western Progress in China	434
Geographic Notes	436
Geographic Literature	442
National Geographic Society	448
Index	449

ILLUSTRATIONS

	Page
Channel Indians of the west coast and western part of Strait of Magellan	15
Tehuelche tent	17
A Tehuelche brave—twenty-five years of age	19
Tehuelche squaw	21
A. P. Davis	25
Map showing the boundary between Nicaragua and Costa Rica	27
Map showing route of Nicaragua Canal as proposed by Isthmian Canal Commission	29
Traveling in Nicaragua	30
Natives of Nicaragua	31
O. H. Tittmann	37
Map of the earth on Mollweide's equivalent or homolographic projection	39
Lieut. Franco Querini	44
Map of a suggested route for a Floating Exposition	51
Old gate in city of Pekin	61
Suchau Creek at Shanghai	62
Midnight Sun, Dawson, June, 1900	67
Northern lights	68
An execution in Pekin	75
Rock Temple at Amoy	76
Hon. O. P. Austin	80
Colonel F. F. Hilder	84
Morning fog over valleys	109
Lifted fog	110
Summer sea fog pouring over Sausalito Hills and through Golden Gate	111
Fog waves	112
Fog billow	113
Evelyn B. Baldwin	118
Geographic mapping of the United States	122
The Santo Domingo of today	130
A cactus-dotted plain revealing its origin in occasional projecting bosses of granite	131
Map showing the country of the old Yuma trail	132
A tongue of the Red Desert	135
Looking down on threescore cross-marked graves	138
The lowest and largest is confined partly by great boulders and granite débris	139
The turreted volcanic mass christened "Klotho's Temple" by Mr. Gill	140
Plains still mantled with herbage and grazed by herds of deer as in pre-Columbian times	142
Map showing the world at the end of the XVIII century	151
Map showing the world at the end of the XIX century	151
End of Columbia Glacier, College Fiord	185
Amherst Glacier, College Fiord	186
Juneau	187
John Muir	188
An Indian totem	189
Eskimo at Plover Bay, Siberia	190
Eskimo at Plover Bay, Siberia	191

Page

Mt. Paulof, Alaska Peninsula ... 192
Henry Gannett ... 195
George M. Dawson ... 197
George Davidson ... 198
Map showing the Netherlands during the first century ... 219
Diagram showing the Netherlands of today and the State of Ohio compared ... 220
Map showing successive enlargements of Haarlem Lake ... 223
Map showing Zeeland about the year 1200 ... 225
Three diagrams showing the enlargement of one small mud flat to ten times its original size ... 226
Forest growth on the Dunes ... 228
The Dunes near Domburg, in the Province of Zeeland ... 229
Diagram showing normal monthly precipitation in Amsterdam, Omaha, Sacramento, Washington ... 231
Pile dikes for protection against marine erosion ... 232
Flood chart showing condition of Holland without dikes ... 233
Sir John Murray ... 239
Relief sketch map of Eurasia—Lambert's projection ... 251
Map—villes sur la surface du globe ... 252
The continental core of Asia ... 253
Map showing arid regions and closed basins of Asia ... 254
Map showing the Mediterranean basin ... 255
Map showing distribution of Atlantic and Pacific Coast types ... 256
Map showing distribution of rainfall on earth's surface ... 258
Map showing climatic divisions ... 259
Map showing the vegetable kingdom ... 260
Map showing "die morphologischen Hauptgebiete der Erde" ... 261
Map showing the races of mankind before the European invasion ... 263
Map showing the interrelation of the races ... 264
Map showing trade routes from the East to Egypt ... 293
Map showing the Roman Empire ... 299
Our guard of mounted Cossacks ... 301
The mountains, looking northeastward from the Pass of Delijan ... 302
The village of Semenovka ... 303
At Jélénovka ... 304
An Armenian household ... 305
The ancient mosque at Erivan ... 306
A study in rags ... 306
The village of Nijhi Akhty on the lava plain ... 307
The village threshing floor at Jélénovka ... 308
Joseph Le Conte ... 310
Map showing Mt McKinley ... 312
Alexander Graham Bell, LL. D ... 353
W J McGee, LL. D ... 354
Gen. A. W. Greely, U. S. Army ... 355
Hon. Seth Low ... 356
Lieut Robert E. Peary ... 359
Mrs Josephine D. Peary ... 360
Map showing the boundaries of territorial acquisitions ... 375
Diagram showing the percentage of native and foreign born in all States and Territories having at least one per cent of their population foreign born ... 384

Page

Diagram showing percentage of whites and negroes in certain States at each census, 1790–1900 386–387
Ploughing up the salt in the sea of Salton 390
Piles of salt at Salton, 280 feet below the level of the ocean 392
Map showing position of Tahiti in mid Pacific 413
Gathering cocoanuts 416
Map of Tahiti 418
Robinson Crusoe hut 419
Crossing a ford 420
Landing 421
Cook Island chief 422
The road to Point Venus 423
Cook Islanders 424
The pile of stones ready for the fire walk 425
The aids began to turn the stones with long, green poles 426
Papa-Ita began to walk through the middle hurriedly 427
Map showing Clark's survey (Texas boundary) 431
Diagram showing literacy of the men of the United States 437
Map of Siberian Railway 438

THE Smith Premier is the Business Man's Best Model for all round office work. It possesses all essential features of construction requisite for easy operation, strong, simple and durable specifications, clean cut work and the highest mechanical accuracy of all writing machines.

THE SMITH PREMIER TYPEWRITER CO.

Catalogue and Information at Washington, D. C., Office, 519 Eleventh Street.

"The Sphinx of the Twentieth Century."

ASIA AND THE CHINESE EMPIRE.

Comparatively few people are familiar with the Chinese Empire as it exists today. In view of the constantly growing Oriental commerce of the United States, everyone should become familiar with the Chinese Empire. The

NEW YORK CENTRAL'S

"Four Track Series" No. 28 gives valuable statistics and information regarding the Flowery Kingdom, and contains a new and accurate map in colors.

A copy of No. 28, "A New Map of Asia and the Chinese Empire," sent free, postpaid, on receipt of five cents in stamps by George H. Daniels, General Passenger Agent, New York Central Railroad, Grand Central Station, New York.

NOW READY

Colonial Fights and Fighters

By CYRUS TOWNSEND BRADY

Stories of exploration, adventure, and battle on the American Continent prior to the War of the Revolution. Mr. Brady relates history in a way that gives it all the charm of fiction while preserving entire accuracy. This is the second book of a series dealing with American battle history, of which "American Fights and Fighters" was the first.

With 16 full-page illustrations taken from famous paintings and rare old prints.

Price, $1.50 net; postpaid, $1.65

McCLURE, PHILLIPS & CO.

PUBLISHERS NEW YORK

The Mutual Life Insurance Co.

OF NEW YORK

RICHARD A. McCURDY, President

Is the Largest Insurance Company in the World

Own Records of the Insurance Department of the State of New York

SHOW THAT The Mutual Life

Has a Larger Premium Income ($30,000,000)

More Insurance in Force ($218,000,000)

A Greater Amount of Assets ($100,000,000)

A Larger Annual Interest Income ($5,000,000)

Writes More New Business ($128,000,000)

And Pays More to Policy-holders ($85,000,000 in 1896)

THAN ANY OTHER COMPANY

It has paid to Policy-holders since its organization, in 1843 $457,063,185.39

ROBERT A. GRANNISS, Vice-President

WALTER R. GILLETTE, General Manager FREDERICK CROMWELL, Treasurer

ISAAC F. LLOYD, Second Vice-President EMORY MCCLINTOCK, Actuary

WILLIAM J. EASTON, Secretary

OFFICE FURNITURE

OUR Department of Office Furniture is equipped with everything requisite to the furnishing of a modern office, a bank, a committee room, etc. Complete assortments and latest and best styles of Office Furniture.

Roll-top Desks, Flat-top Desks, Standing Office Desks, Typewriter Desks, Typewriter and Letter Press Stands, Revolving Office Chairs, Stationary Office Chairs, Stationary Book Cases, Revolving Book Cases, Sectional Book Cases, Sectional Filing Devices, Office and Library Tables, Wardrobes, Leather Furniture, etc.

Special OFFICE FURNITURE made to Order.

We are the Washington Agents for the Gunn Sectional Book Cases and Filing Devices.

WOODWARD & LOTHROP

NEW YORK WASHINGTON PARIS

JUDD & DETWEILER, PRINTERS, WASHINGTON, D. C.

XUM